THE INDUSTRY'S RECOGNIZED AUTHORITY

ROCK PRODUCTS

MAY 1944

CEMENT · SAND AND GRAVEL · CRUSHED STONE · LIME · GYPSUM
READY-MIXED CONCRETE · CONCRETE PRODUCTS · INDUSTRIAL MINERALS

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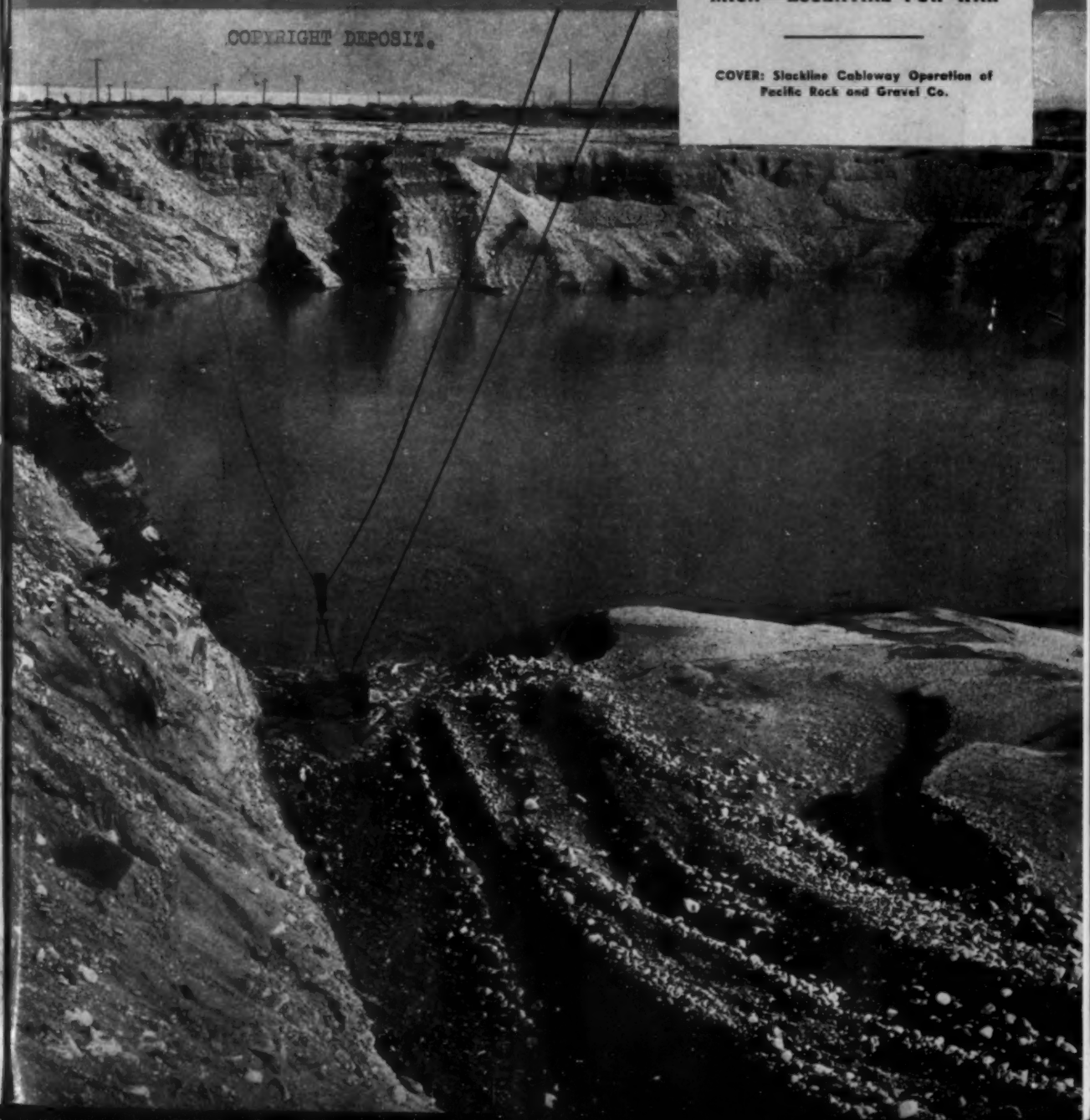
SLACKLINE EXCAVATION
ROTARY KILN OPERATION
STIMULATING AGSTONE USE
CURING CONCRETE PRODUCTS
MICA—ESSENTIAL FOR WAR

COVER: Slackline Cableway Operation of Pacific Rock and Gravel Co.



JUN 26 1944

ELIMINATE COSTLY SLEDGING

WILLIAMS "SLUGGER"

CRUSHES ONE MAN SIZE STONE TO 1¼", ¾" OR AGSTONE IN ONE OPERATION

Open view of the "Slugger" Crusher showing heavy duty hammers, liners and discs.

With the Williams "Slugger" Crusher and Pulverizer it is possible to crush large pieces of stone weighing from 75 to 100 pounds to 1¼", ¾" or agricultural limestone in ONE OPERATION. This not only eliminates sledging but also does away with the unnecessary expense of a primary crusher.

The "Slugger" represents the most advanced type of crushing equipment on the market today. With seven sizes to choose from, producing from 4 to 30 tons per hour, every producer can profitably install a Williams.

WILLIAMS FINE GRINDING EQUIPMENT WITH AIR SEPARATION

For faster, more efficient fine grinding of limestone, lime, coal, talc, etc., there is a Williams Roller Mill with Air Separation to fit your requirements. Finenesses from 100 to 400 mesh. Williams also builds Impact Mills with Air Separation; Mechanical Air Separators for classifying finely ground material or taking the fines out of dry material.

Write Today for Bulletin 621

OUTSTANDING "SLUGGER" FEATURES

MANGANESE STEEL HAMMERS
Heavy duty slug end hammers are standard equipment in the "Slugger."

HAMMER ADJUSTMENTS OVERCOME WEAR
Discs are arranged so that the hammers can be set out as they wear on the end.

MANGANESE STEEL ADJUSTABLE BREAKER PLATE
Adjustable towards the hammers.

ELECTRIC STEEL FRONT END
The part which holds the breaker plate is an electric steel casting—3½ times stronger than cast iron.

COVER LINERS 1" THICK
Manganese steel liners.

SIDE LINERS 1" THICK
Manganese steel liners.

SEVEN SIZES
30 to 150 horsepower, stationary or portable models.

WILLIAMS PATENT CRUSHER & PULVERIZER COMPANY

800 St. Louis Avenue — St. Louis 6, Mo.

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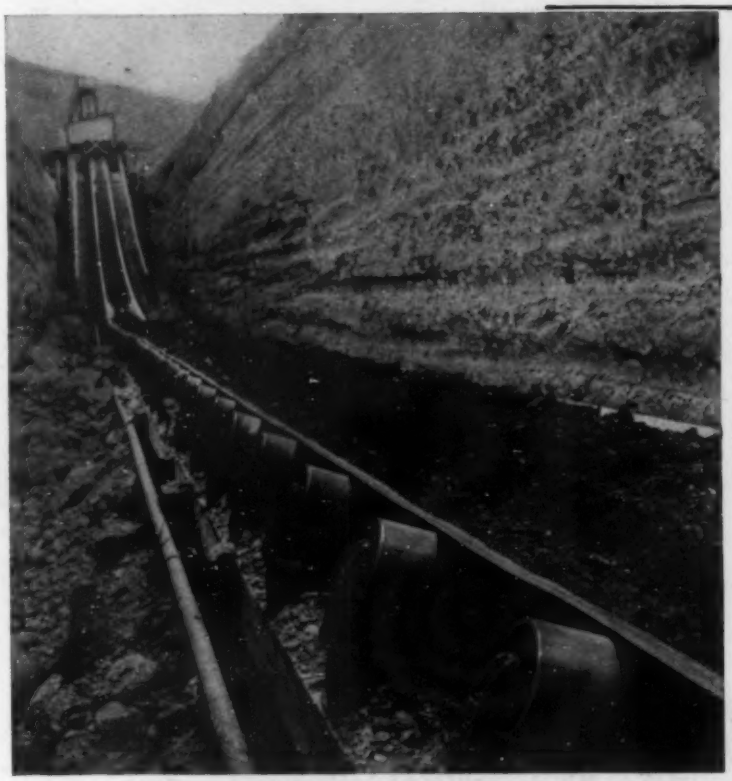
OLDEST AND LARGEST BUILDERS OF HAMMERMILLS IN THE WORLD

Williams

PATENT CRUSHERS GRINDERS SHREDDERS

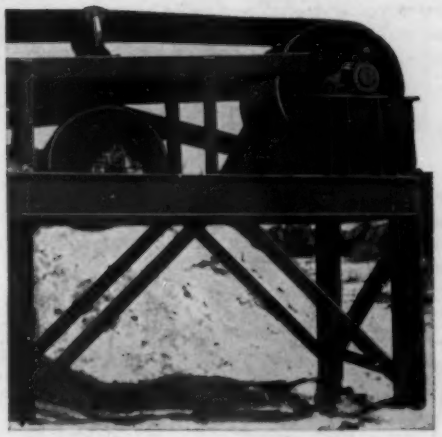
Efficient, High-Capacity Handling with LINK-BELT BELT CONVEYORS



Anderson Ranch Dam

. . . is a U.S. Bureau of Reclamation Project located on the South fork of the Boise River, approximately 71 miles from Boise, Idaho. Low cost handling of excavated material in a continuous stream, with minimum attendance and elimination of rehandling is accomplished on this job with Link-Belt Conveyors. These conveyors extend along the edge of mountains and carry earth through several tunnels from the borrow pit, located 2 miles away. They all employ Link-Belt Anti-Friction Idlers and welded steel terminal pulleys. Rubber-tread impact idlers are employed at conveyor loading points to absorb shock, and self-aligning idlers located at proper intervals along both the carrying and return runs, automatically serve to keep the conveyor belt in line.

You can be assured of maximum belt life, minimum power and maintenance cost, and dependable trouble-free service with Link-Belt Anti-Friction Belt Conveyor Idlers and other equipment. Link-Belt engineers pioneered in the development of anti-friction belt conveyor idlers and have consistently improved the original, fundamental design–the grease seal, bearing adjustment, shaft mounting and the supporting stands and brackets. All with the result that today's Link-Belt designs offer the very best in belt conveyor equipment.



Shasta Dam . . . All 163 end-pulleys (38" face for 36" wide conveyor belts) for conveyors for Shasta Dam to handle sand and gravel, were of the Link-Belt welded steel type. The picture above shows two of these in service on one of the 26 individual conveyors which make up the conveying system. All the head pulleys are rubber-lagged, 48" diameter. Many are mounted on 5-15/16" diameter shafts, and all are furnished with heavy-duty bearings.

LINK-BELT COMPANY

Chicago 9, Indianapolis 6, Philadelphia 40, Atlanta, Dallas 1, Minneapolis 5, San Francisco 24, Toronto 8. Offices, Factory Branch Stores and distributors in principal cities.

LINK-BELT

BELT CONVEYOR EQUIPMENT

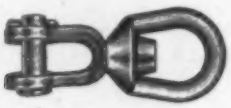
IDLERS • TRIPPERS • BELTS • PULLEYS • BEARINGS • DRIVES

A prominent aviation manufacturer used a Laughlin Safety Hook, as shown, as part of a riveting machine set-up purposely devised for the safety and efficiency of women war workers.

This hook's unique, stout-springed safety latch holds its burden securely despite strain or jolts. That's why workers like it — it's safer.

This latch is available on all sizes and styles of Laughlin hoist hooks.

LAUGHLIN THIMBLES: Two styles . . . regular and plow steel pattern (extra heavy for use with plow steel and high tensile wire ropes).



LAUGHLIN SWIVELS: Made in the following types: jaw and jaw, chain swivel, swivel with jaw end, swivel with swivel. Drop-forged.

Write for catalog showing the complete line of Laughlin Wire Rope Fittings

Distributed through Mill, Mine and Oil Field Supply Houses

Look for Laughlin Products in PIT & QUARRY HANDBOOK

FORGING A SHARE IN VICTORY

THE THOMAS LAUGHLIN Company
PORTLAND 6, MAINE

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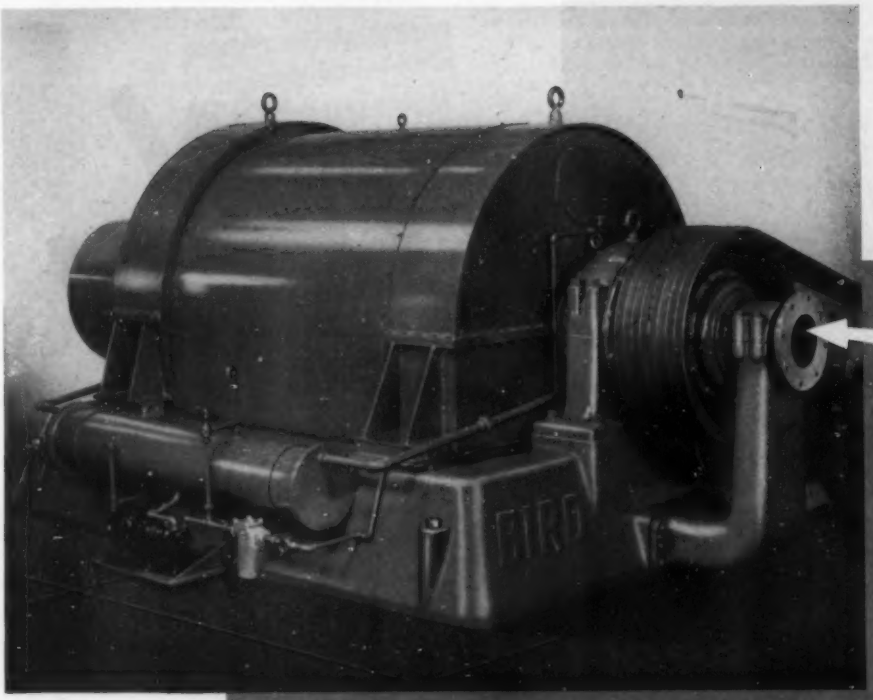

PUT THE SLURRY FROM THE GRINDING CIRCUIT IN HERE

. . . AND WHAT HAPPENS?

The fines are delivered to the kiln without thickening—ready for efficient burning with minimum fuel consumption. Tube mill production is materially increased.

The BIRD CENTRIFUGAL CLASSIFIER

handles the slurry at mill consistency. It does the job automatically, in small space at low cost.

Now is the time to get the whole story on this BIRD and just what it can do in your circuit. Write

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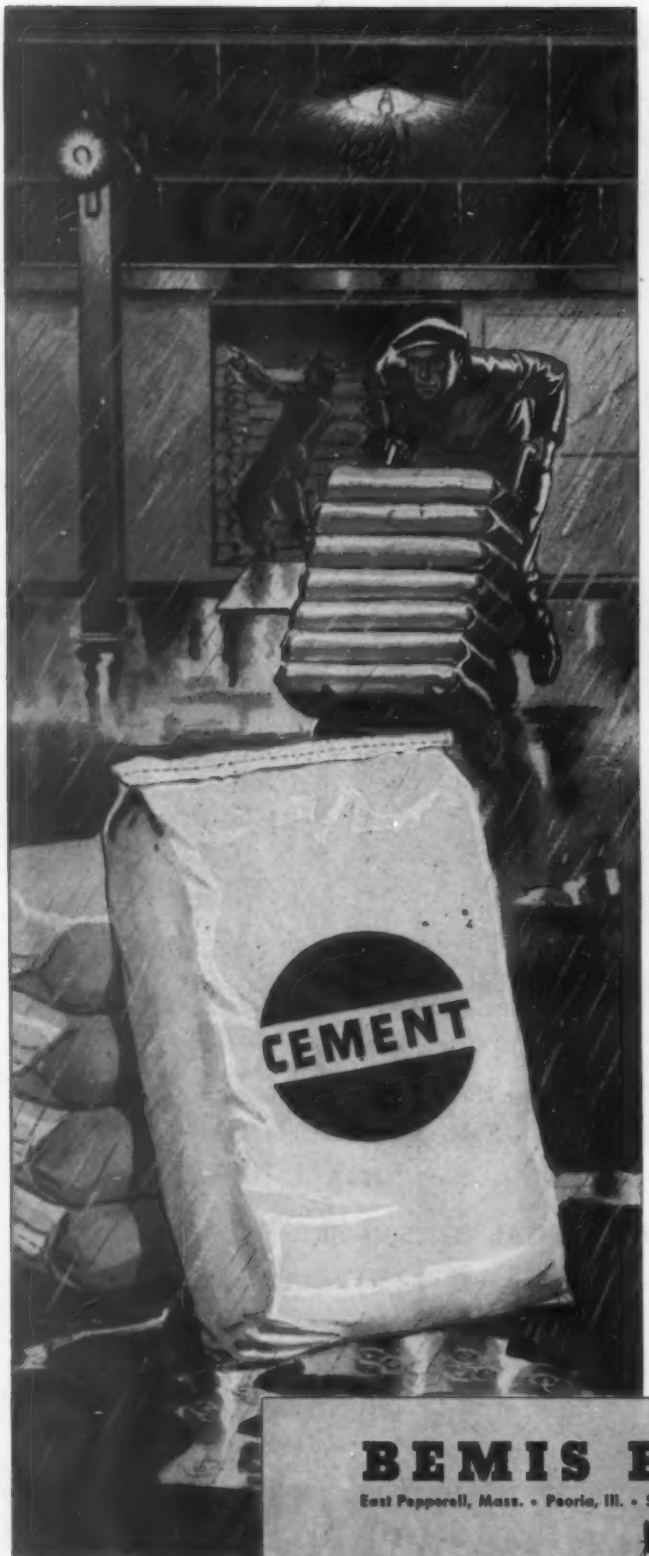
BUILDERS OF BIRD CONTINUOUS CENTRIFUGAL FILTERS



TRY THIS!

and prove to yourself that BEMIS MULTIWALL PAPER BAGS are showerproof

TAKE a Bemis Multiwall Paper Bag, filled with your cement, and set it out in the weather. Let it rain... let it pour! (If the air is filled with sunshine around your plant, use a hose to simulate rain.)

After you're convinced that the bag has been in more weather than it ever will have to stand in ordinary use, let it set 'til it's dry. Then open it, and see how freely the cement pours out!

Protection against sudden showers is only *one* advantage of using Bemis Multiwall Paper Bags to package your cement. You'll find that these containers are economical... that they have strength to reduce lost time due to breakage on the production line... that they have ruggedness to protect your product in transit and on the job.

We'd like to have you know about the qualities of Bemis Multiwall Paper Bags before you place another bag order. So, we suggest you try this experiment soon. We'll send sample bags for the trial, if you'll ask for them. No charge and no obligation, of course.

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FIRST IN RUBBER

B. F. Goodrich grommet-type wire V belt is the first and only of its kind

New development designed for severe small-space power transmission applications

THESE drawings show the outstanding feature of the new B. F. Goodrich grommet-type wire V belt. They show the construction of the wire grommet that is responsible for the belt's performance under unusually severe operating conditions.

To make the grommet, the wire cable is formed into a loop, then wound spirally *on itself* up to the needed size. Then cord is wound spirally on the wire in the opposite direction to give balance to grommet and belt. The result is a truly endless wire grommet without loose ends to break out and get tangled in machinery. Stretch is to all intents eliminated.

There are many possible applications for a B. F. Goodrich grommet-type wire V belt drive. If noise and dirt are problems, noisy and dirty drives can be replaced by this revolutionary new B. F. Goodrich development. If space is limited, grommet V belt drives can usually be engineered to fit such space without sacrifice of power transmission efficiency — *and* performance and maintenance are excellent at either low or high speeds.

The B. F. Goodrich representative near you will be glad to work with you on power transmission problems. Or, for more information about the new grommet-type wire V belt, write *The B. F. Goodrich Co., Industrial Products Division, Akron, O.*

B.F. Goodrich
RUBBER *and* SYNTHETIC *products*

A Key to BETTER MAINTENANCE

Continuous operation, excessive wear, and today's replacement difficulties demand *better maintenance* of equipment.

A key to better maintenance is *better lubrication.*

Sinclair offers lubricants highly specialized for better lubrication of *CONSTRUCTION MACHINERY.*

Sinclair Pennsylvania and Opaline Motor Oils stand up under heavy duty service . . . have long-lasting film strength that holds down engine wear, lay-offs and replacements.

Opaline and Universal Gear Lubricants and Gear Oils maintain highly efficient lubrication under severe punishment in transmissions, differentials and enclosed gears.

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Where continuous loads and overloads threaten shorter life for moving parts, Sinclair lubricants make for *better maintenance.* Consult us about your lubrication problems.

(Write for "The Service Factor" — published periodically and devoted to the solution of lubricating problems.)

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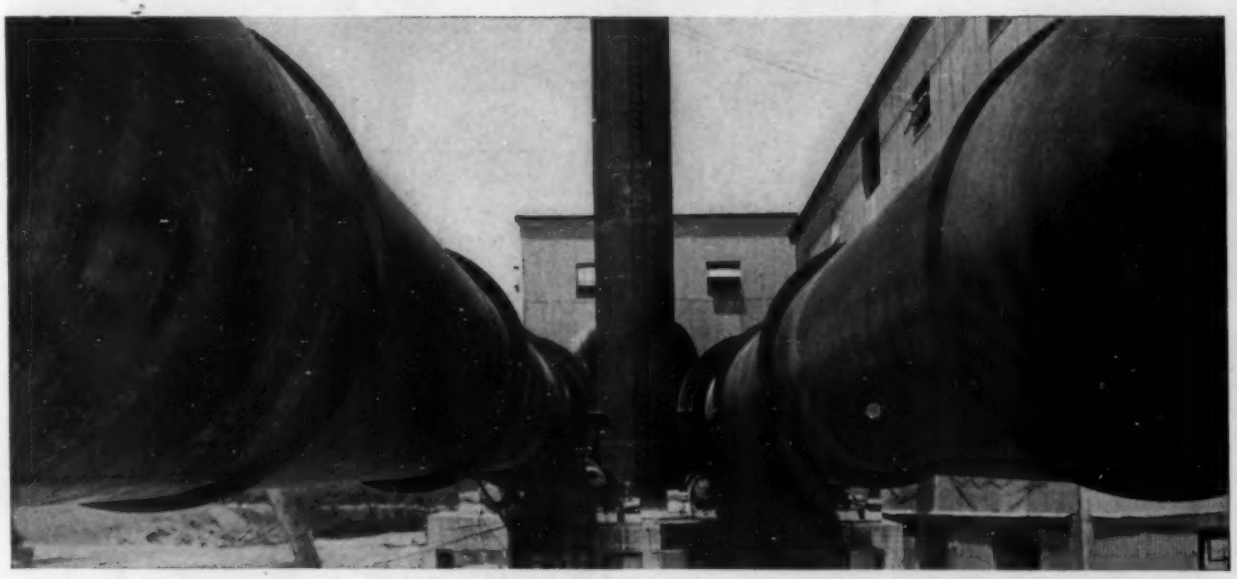
Fifty feet long- or five hundred



WE BUILD

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Elevators

the Shells are in one piece!

Whether it be a small unit built of light steel sheet or the largest made of very heavy plate, EVERY Traylor Rotary Kiln, Cooler or Dryer Shell is literally a single piece, smooth, straight and generously strong to cope with the severest of service. This type of construction was pioneered by Traylor years ago.

By our original and constantly improved methods the edges of the plates forming the complete shell are so thoroughly fused that the joints are stronger than the parent metal. And smooth, too—in fact, if the surfaces were to be machined it would be difficult to see the joints.

This type of kiln shell contributes measurably to securing and maintaining alignment, and renders Traylor Rotary Kilns, Coolers and Dryers thoroughly dependable, but this is not all that can be said. Into each and every unit are built many ideas, represented by devices to increase efficiency and decrease costs, ideas based upon our engineers' intimate knowledge of the work to be done, knowledge gained by constant study and observation.

Traylor Rotary Kilns, Coolers and Dryers in use in the Cement, Lime and Process industries now total close to nine miles in length of an average diameter of about eight and one-half feet.

SEE OUR BULLETIN 115

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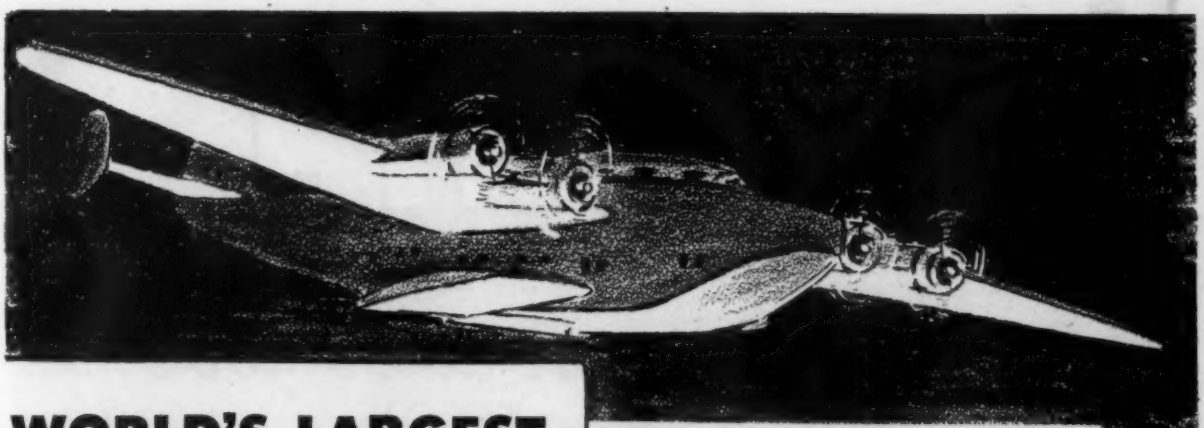


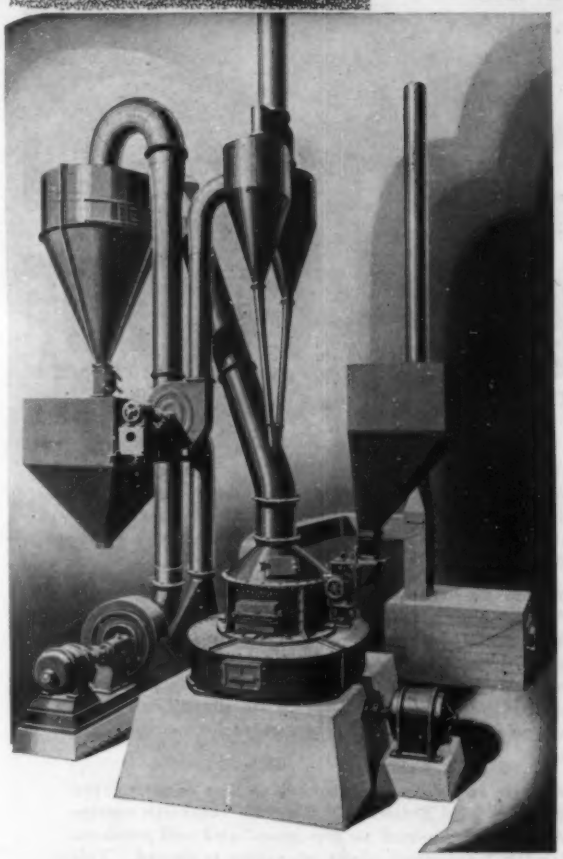
WORLD'S LARGEST . . .

in Cargo Planes . . .

it's the MARS

in Pulverizing . . it's the

RAYMOND SUPER MILL

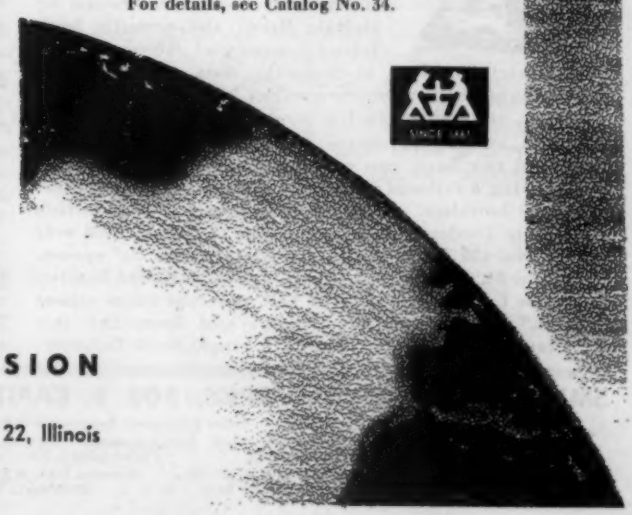


Things are done *in a big way* these days, and the production of powdered materials is now on a scale that shatters all pre-war records of high capacities and low costs.

There is no more economical method known than the use of Raymond SUPER MILLS for pulverizing agricultural limestone, gypsum, bauxite, barytes and other essential non-metallics, up to forty tons per hour.

Pneumatic feed control, self-lubricating oil journals, air-drying system and new operating features, all assure improved performance with minimum supervision.

For details, see Catalog No. 34.



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TELSMITH
GRAVEL PLANT
serving urgent war jobs

Telsmith Jaw Crusher

Telsmith Sand Tanks

Telsmith Gyrasphere

★ Urgent war projects near Pawtucket, R. I. demand large amounts of concrete aggregate. Owned by McHale Bros., the recently built Telsmith-equipped River Sand & Gravel Co. plant at Seekonk, Mass., turns out 180 tons per hour producing minus 1½" sand and gravel. 40% of total product is sand.

A 1¼ cu. yd. shovel and two end dump trucks feed raw bank run gravel into an 8 cu. yd. hopper having a railroad rail grizzly that rejects the few oversize boulders. A 30" x 5'6" Telsmith Reciprocating Plate Feeder feeds material out of hopper and over a No. 450 Telsmith Rotary Grizzly with 3¼" spaces. Plus 3¼" goes to an 18 x 30 Telsmith Roller Bearing Jaw Crusher. A 30" x 73' belt conveyor takes minus 3¼" direct from the grizzly, and from the jaw crusher, to a 4' x 10' Telsmith Single Deck Pulsator. Plus 1½" from this scalping screen goes into a No. 36 Telsmith Gyrasphere Crusher; and when crushed returns to the 30" primary conveyor via an 18"x48'6" conveyor.

Minus 1½" from the scalping screen goes via a 24" x 186'6" finished product conveyor to a 5' x 12' Telsmith 2-Deck Pulsator for washing and sizing. Sand is flumed to two No. 8 Telsmith Sand Tanks on a tower independent of main plant. The two sizes of gravel are deposited in two 20' diam. concrete-block silo bins, fitted with bin gates for loading into trucks.

Why do so many operators with war construction jobs depend on Telsmith? Because Telsmith equipment can be pushed to *top speed* and *will produce*. Telsmith Engineers' plant planning is sound. Telsmith Service is fast. *Get Bulletin G-11.* G-108R

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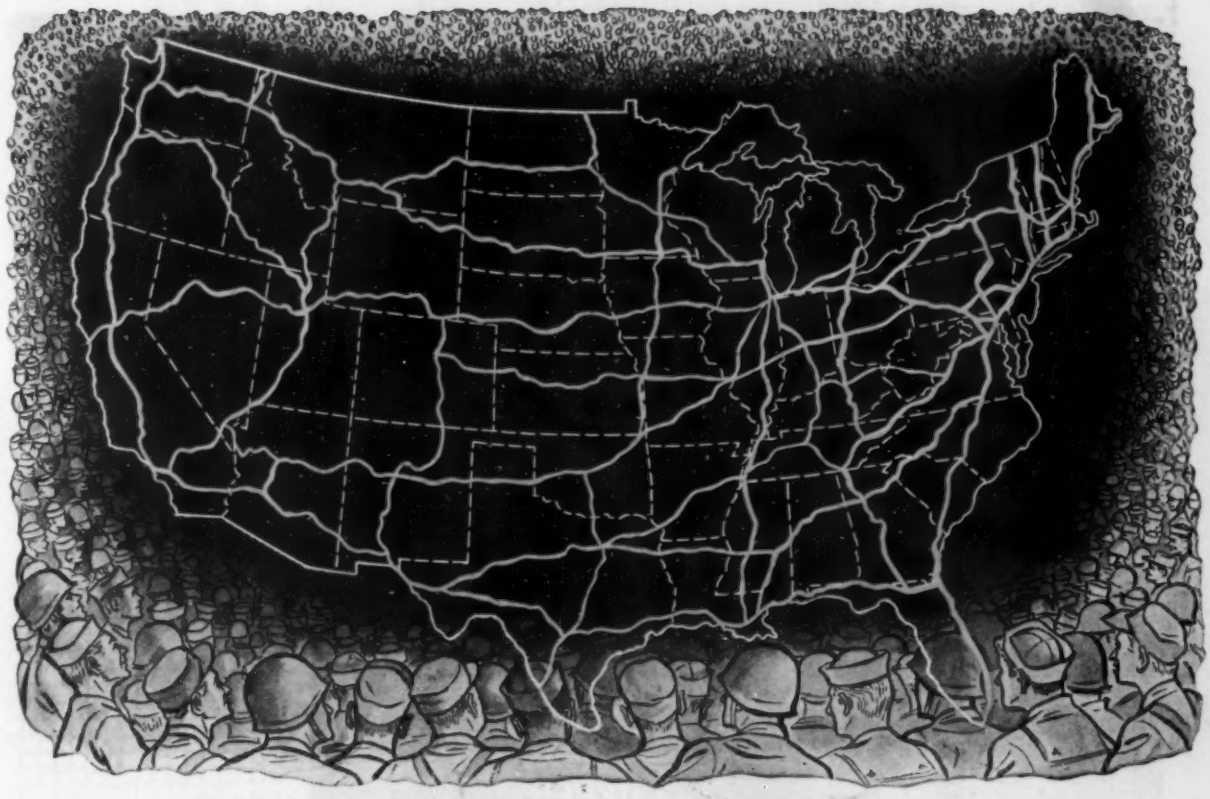

PLANNED POSTWAR HIGHWAY PROGRAM MEANS

Quick Employment For 3 Million

No one wants another depression 13,000,000 people deep. It will be much better to measure the height of national prosperity by the number of people employed.

Since it is generally agreed that gainful employment is the No. 1 factor in the national economy, it is to every American's best interest to get behind and push forward every sound postwar plan. ***One such is that of the American Road Builders' Association.***

It is sound because it will quickly and directly employ 3,000,000 people on a planned highway building program sorely needed before the war and absolutely necessary postwar.

It is sound because it eliminates attempts to fill depressions with improvised work relief amply demonstrated to be slow, costly, inefficient, and demoralizing.

It is sound because it is based upon plans and specifications carefully prepared in advance, cost estimates made in advance by public engineers, bids made by competing contractors who are willing to back up their judgment with their own funds, and the requirement of ample bond to further guarantee the delivery of quality work at contract costs and on time.

It is sound because it makes more efficient use of on-site employment and affords far more off-site employment in the production of materials and equipment. Thus, in addition to stimulating the consumer goods market, it induces far reaching employment throughout the production, transportation, and service industries. Studies made by the U. S. Public Roads Administration indicate that the proposed investment of 3 billion dollars annually in highways eventually results in business transactions totaling 9½ billion dollars.

Every American who wants to get early enjoyment of a better planned highway system, constructed better at the lowest bid cost, should write for and read the 64-page book entitled "A Sound Plan For Postwar Roads and Jobs." Among other things it points out that nearly enough in motor vehicle taxes is normally collected to pay for this sound, planned program if used for the purpose intended.

WRITE FOR THIS FREE BOOK:::

E-44

Address

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OR

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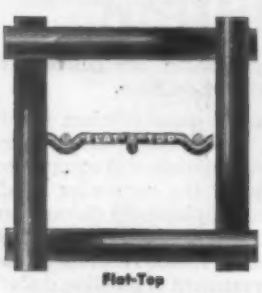

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"The Perfect"

Wire Cloths and Screens

OF

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GALVANIZED STEEL
STAINLESS STEEL
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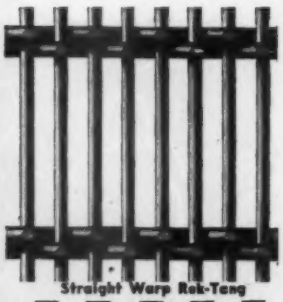
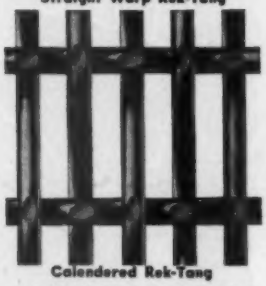
PHOSPHOR BRONZE
BRASS
COPPER
MONEL
NICKEL
ALUMINUM

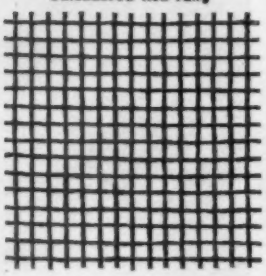
ANY SPECIAL METAL FOR ANY SERVICE



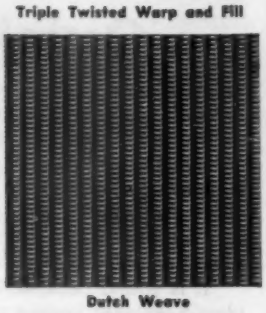
Straight Warp Rek-Tang



Calendered Rek-Tang



Triple Twisted Warp and Fill



Dutch Weave

"Perfect" WEAVES

Arch-Crimp
Coiled
Double-Crimp
Double-Fill
Dutch
Flat-Top
Intermediate-Crimp
Rek-Tang
Selvage-Edge
Straight-Warp
Stranded
Sta-Tru
Triple-Warp
Twilled
Twisted-Fill
Twisted-Warp

"Perfect" PROCESSING

Arc-Welding
Bending
Binding
Brazing
Calendering
Coiling
Crimping
Cutting
Dipping
Dishing
Finishing
Flanging
Flattening
Forming
Framing
Galvanizing
Jointing
Knuckling
Painting
Rolling
Selvaging
Shaping
Shearing
Slitting
Soldering
Spot-Welding
Squaring
Stitching
Tack Welding
Trimming

"Perfect" PRODUCTS

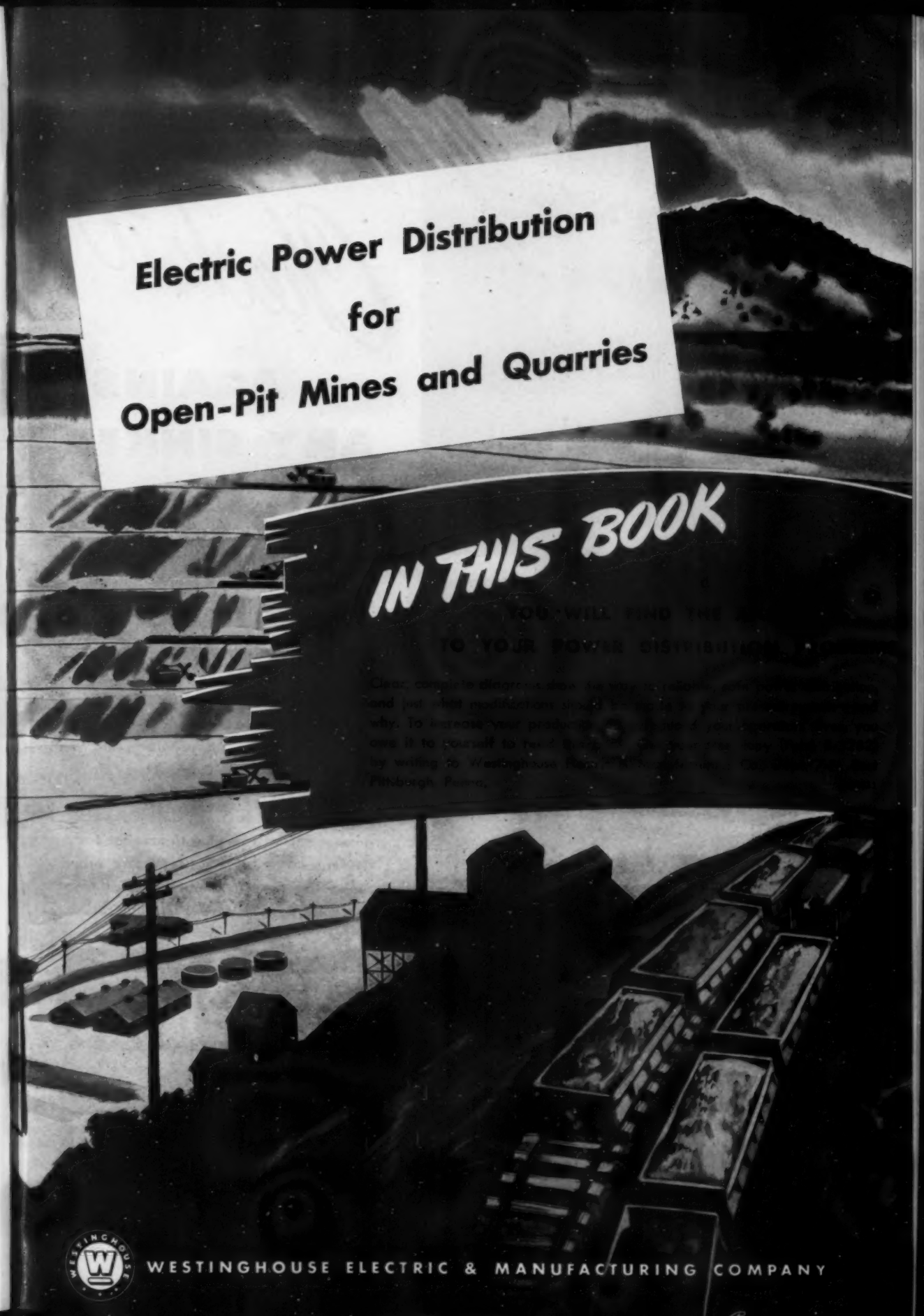
Baskets
Circles
Coils
Cones
Cylinders
Discs
Forms
Leaves
Lengths
Panels
Pieces
Ribbons
Rings
Rolls
Sections
Segments
Strips
Templates

Illustrations show items listed in bold-face type. Other wire cloths and screens will be illustrated in subsequent advertisements of this series.

Coil-Screen

THE LUDLOW-SAYLOR WIRE CO.

ST. LOUIS 10, MISSOURI


Electric Power Distribution
for
Open-Pit Mines and Quarries
IN THIS BOOK
WESTINGHOUSE ELECTRIC & MANUFACTURING COMPANY

Check it

AGAINST ANY SINKER IN ITS CLASS

THE fast drilling speed and powerful rotation of the CP-42 Sinker make it ideal for general excavation, road work, and quarry drilling. Its air blow keeps even the deeper holes free of cuttings.

Check the air consumption — and the low maintenance. Try the 56-pound CP 42 Sinker, job for job, against any sinker in its class; you'll find there isn't a better all-around performer. The CP office nearest you will be glad to arrange for a demonstration of CP-42 or any other Sinker on your own work, under your own conditions. Write for demonstration.

There's a CP Sinker for every purpose, from the 28-pound CP-22 to the 119-pound, heavy duty CP-60. All are convertible to wet machines.

★★★★★★★★★
PNEUMATIC TOOLS
ELECTRIC TOOLS
(Hicycle...Universal)
ROCK DRILLS

CHICAGO PNEUMATIC
TOOL COMPANY
General Offices: 8 East 44th Street, New York 17, N. Y.

★★★★★★★★★
AIR COMPRESSORS
VACUUM PUMPS
DIESEL ENGINES
AVIATION ACCESSORIES

AMERICA IS *Built with Aggregate!*

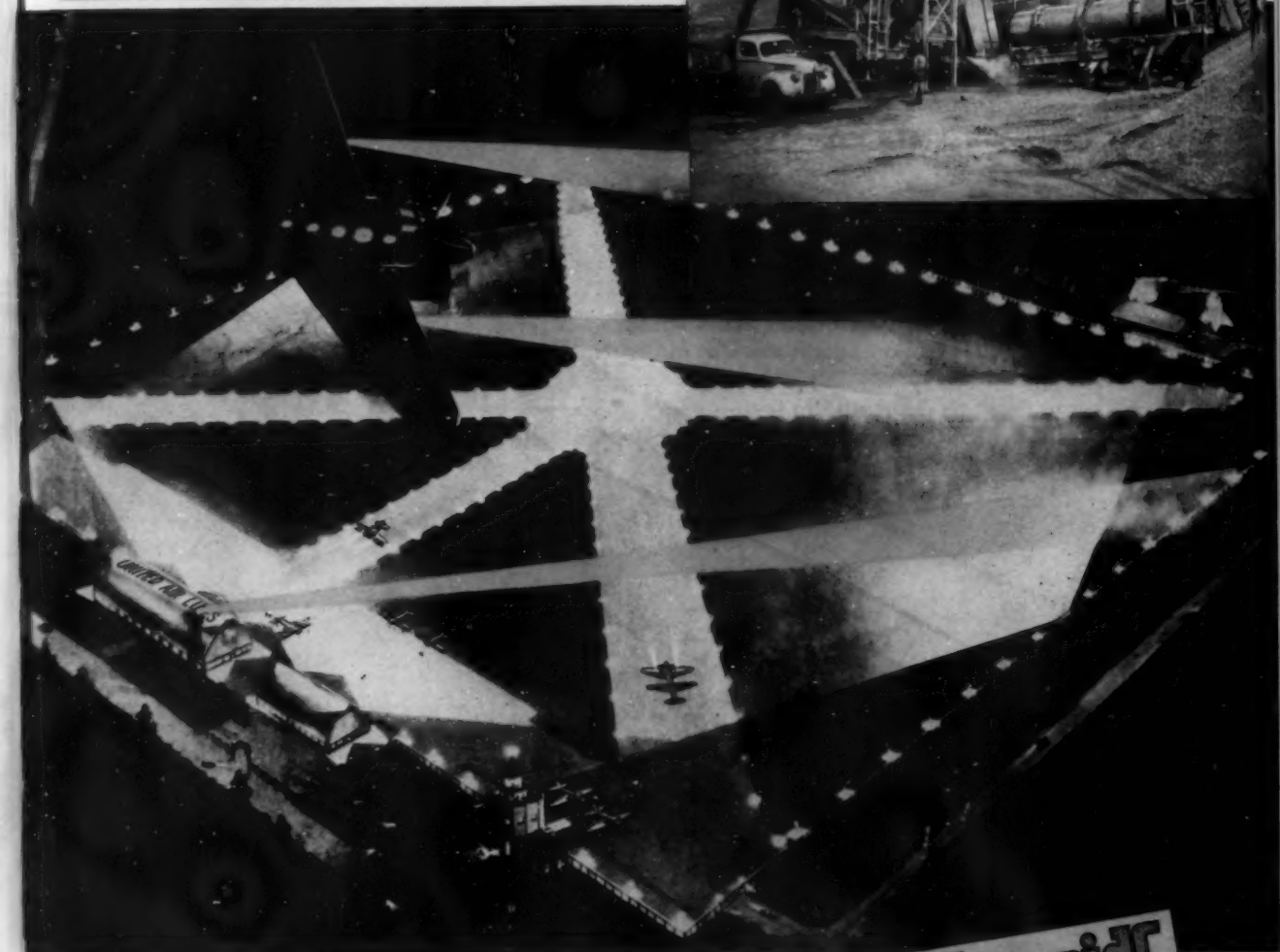


Photo b
Ewing Gall

Cedarapids

Built by IOWA

HIGHWAYS TO THE SKY!

To the global airlines, highways to the sky are runways that are safe, smooth, permanent, and have tremendous load-carrying capacity. The engineer and contractor see them as aggregate at so many cents per yard. And, that price has to be the lowest possible.

Refinements in crushing equipment are lowering production costs despite increasingly strict specifications. Such improvements are the result of American free enterprise which developed the line of Cedarapids plants.

When you have a contract to build tomorrow's HIGHWAYS TO THE SKY, use aggregates produced by Cedarapids crushing plants. All sizes and types available. You'll get better results and it will cost you less.

Remember it's Iowa — headquarters for Aggregate Producing Equipment!

IOWA MANUFACTURING COMPANY
CEDAR RAPIDS, IOWA

THE IOWA LINE

of Material Handling Equipment Includes

ROCK AND GRAVEL CRUSHERS
BELT CONVEYORS — STEEL BINS
BUCKET ELEVATORS
VIBRATOR AND REVOLVING SCREENS
STRAIGHT LINE ROCK AND GRAVEL PLANTS
FEEDERS — TRAPS
PORTABLE POWER CONVEYORS
PORTABLE STONE PLANTS
PORTABLE GRAVEL PLANTS
REDUCTION CRUSHERS
BATCH TYPE ASPHALT PLANTS
TRAVELING (ROAD MIX) PLANTS
DRAG SCRAPER TANKS
WASHING PLANTS
TRACTOR-CRUSHER PLANTS
STEEL TRUCKS AND TRAILERS
KUBIT IMPACT BREAKERS

PEACE WILL FIND MARIONS BUILDING A BETTER WORLD FROM THE NATION'S ROCK PILES

For more than half-a-century, MARION shovels have been called "Rock Shovels." This nickname has weathered several wars and still remains as an endorsement of MARIONS' powerful performance in heavy digging. This unchallenged reputation will serve them well during the trying years ahead when a better world will arise from the Nation's rock piles, with the aid of MARIONS.

THE MARION STEAM SHOVEL COMPANY • MARION, OHIO,

Offers

SHOVELS • CRANES
DRAGLINES • PULL-SHOVELS
CLAMSHELLS • WALKERS

To Make Short Work of Every Material Handling Job

¾ CU. YD. TO 35 CU. YDS.

"DELIVERING THE GOODS"
FOR
VICTORY
Many of the chemicals used for making explosives for land, sea and air forces are packaged in Multiwall Paper Bags. The finest industrial peacetime package has become the essential wartime package.

Multiwall Paper Bags are required for industrial shipments of food products, chemicals, fertilizers, and construction materials — for domestic use and overseas to our armed forces and civilian populations of allied nations and occupied countries.

St. Regis MULTIWALL PAPER BAGS

MULTIPLY PROTECTION • MULTIPLY SALEABILITY

ST. REGIS PAPER COMPANY

TAGGART CORPORATION • THE VALVE BAG COMPANY

NEW YORK 17: 230 Park Ave. CHICAGO 1: 230 No. Michigan Ave.
BALTIMORE 2: 1140 Baltimore Trust Bldg. SAN FRANCISCO 4: 1 Montgomery St.

IN CANADA:

BATES VALVE BAG CO., LTD.
Montreal, Quebec
Vancouver, British Columbia

Boston, Mass. Birmingham, Ala. Dallas, Texas Denver, Colo.
No. Kansas City, Mo. Los Angeles, Calif. New Orleans, La.
Franklin, Va. Seattle, Wash. Nazareth, Pa. Toledo, Ohio

Stockpiling

Labor saving equipment is of the utmost necessity now and in the immediate months to come. To meet this need, WPB has released a limited schedule of Barber-Greene Model 82-A Bucket Loaders and Wheel Mounted and Permanent Belt Conveyors.

Preparation of aggregate and stock piling sized material is greatly facilitated with Barber-Greene Permanent and Portable Belt Conveyors. Reclaiming from stock piles is speeded up using the high capacity Model 82-A Bucket Loader, requiring less idle truck time. Often truck drivers easily fill in as loader operators loading their own trucks.

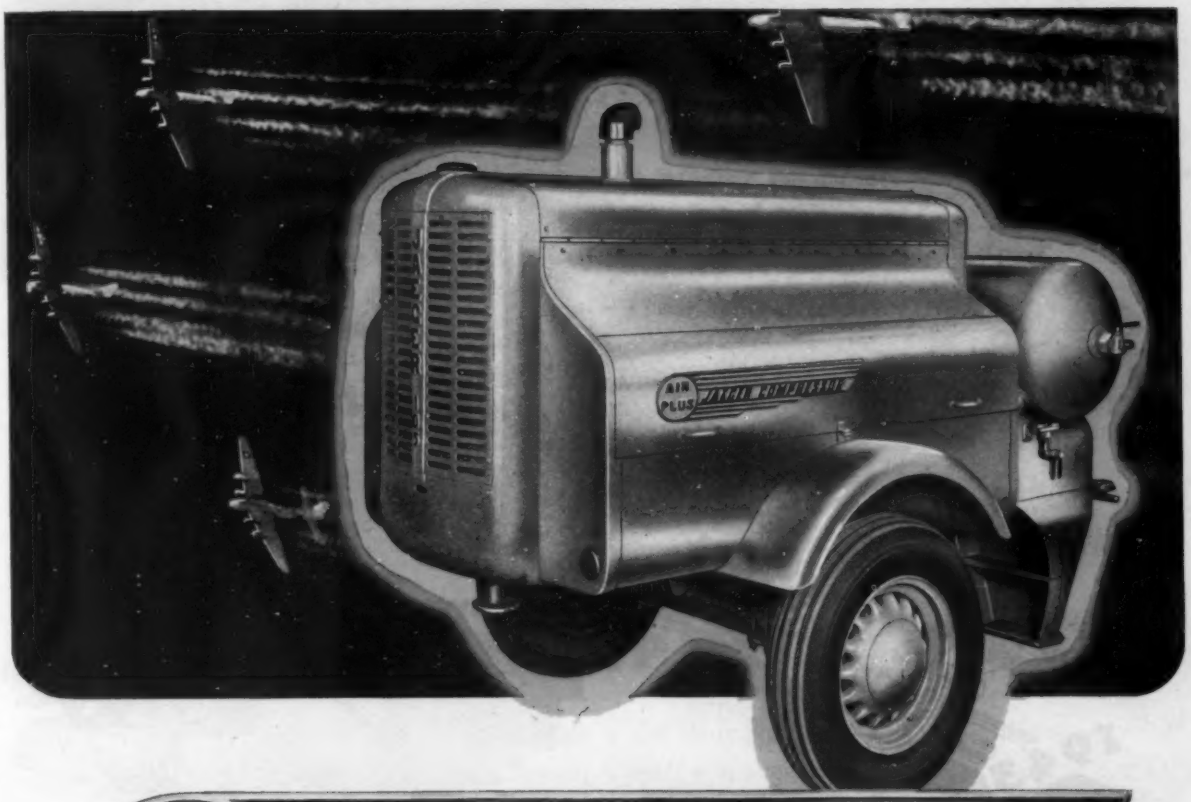
Barber-Greene engineers can assist you in utilizing your present equipment to its fullest advantage, as well as suggesting new equipment if it is necessary. Write to Sales Engineering Department, Barber-Greene Company, Aurora, Illinois, U.S.A.

44-24

BARBER-GREENE

AURORA, ILL.

For You When This War is Over . . . COMPRESSORS BUILT TO THE STANDARDS OF AIRCRAFT MOTORS



AIR PLUS JAEGER COMPRESSOR

Under the name "AIR PLUS", The Jaeger Machine Company is today building the finest 2-stage, air-cooled compressor mechanism yet developed to supply air up to 500 cu. ft.

As in aircraft motors, the moving parts are micro-honed and lapped, resulting in lifetime characteristics of high efficiency, smooth operation and ample reserve power for extreme altitude work.

The Jaeger-designed, air-animated "Tough Swedish Twin" Valves, which insure air plus coolness, are an advance in compressor design. Accessibility has been so well provided that it is a matter of minutes to remove and replace any compressor part.

All Jaeger equipment produced today is vitally needed for war. We ask you to be patient. Our experience and greatly improved facilities will be ready to help you win your battles tomorrow.

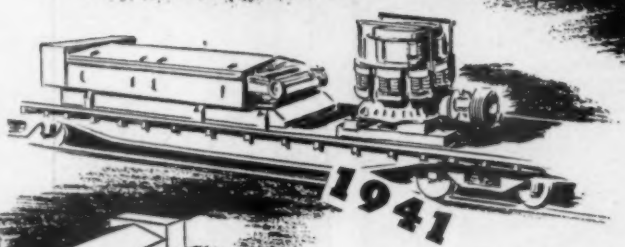
THE JAEGER MACHINE CO., COLUMBUS 16, OHIO

JAEGER *Engineered* **EQUIPMENT**

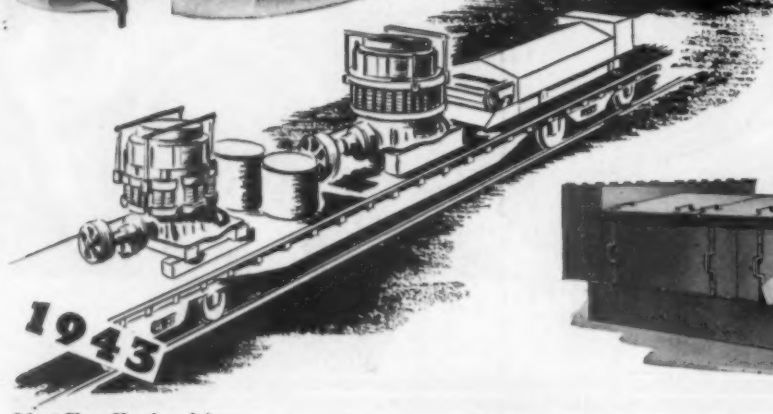
"AIR-PLUS" 2-STAGE AIR-COOLED COMPRESSORS 60 TO 500 FT. — "FLEET-FOOT" CRANE-LOADERS — "SURE PRIME" CENTRIFUGAL PUMPS — "SPEEDLINE" BUILDING MIXERS — "DUAL-MIX" TRUCK MIXERS — "JAEGER" HOISTING ENGINES AND TOWERS — "JAEGER-LAKEWOOD" PAVING EQUIPMENT

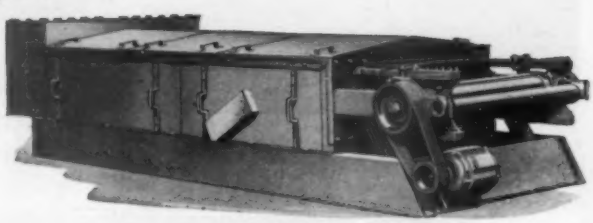
ANOTHER REPEAT ORDER
FROM THE CEMENT INDUSTRY

EXPERIENCE OF MEXICAN CEMENT MILL IS TYPICAL OF THAT OF MANY SATISFIED CONE USERS



3 foot Short Head Cone and 42" x 12' Symons Screen.





3 foot Short Head and 4 foot Standard Cones and 42" x 12' Screen.

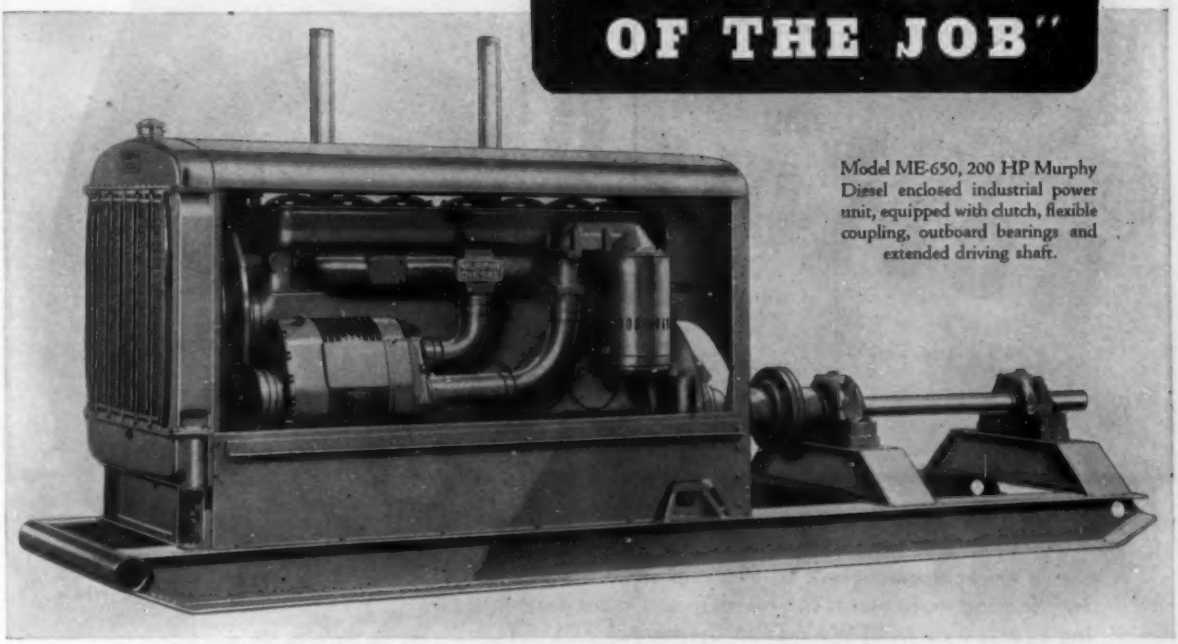
In 1941, Cementos Mexicanos, S. A., the largest and most progressive cement mill in Northern Mexico, installed a 3 foot Short Head Cone and a 42" x 12' Symons Screen ahead of their two raw grinding units; one a 6' x 24' mill, the other a 7' x 6' x 26' mill, both of the two compartment type. Prior to the installation of the Symons Short Head crusher, feed to these mills averaged 1¼ to 1½ inch in size. The resultant finer mill feed, all minus ⅝ inch produced by the Symons Short Head Cone operating in closed circuit, greatly increased the output of these raw grinding mills without increase in power consumption. After two years operation and based on careful check of capacity, power consumption and maintenance costs, a duplicate Short Head Cone and Screen were ordered in 1943 for their expanded operations. With a positive and constant feed of minus ⅝ inch to the mills, it was possible to eliminate the large grinding balls with an appreciable reduction in grinding mill maintenance costs.

• In addition to the two Short Head Cones installed in the raw grinding section, a four foot Standard Cone crusher is also being installed for preliminary crushing operations. • That so many users of Symons equipment place repeat orders is evidence of the satisfactory performance given by these crushers and screens.

NORDBERG MFG. CO.
MILWAUKEE 7, WISCONSIN
NEW YORK · LOS ANGELES · LONDON · TORONTO

SYMONS } CRUSHERS SCREENS

"THE *Heart* OF THE JOB"



Model ME-650, 200 HP Murphy Diesel enclosed industrial power unit, equipped with clutch, flexible coupling, outboard bearings and extended driving shaft.

Specify MURPHY DIESELS

ON most jobs, your power plant is the heart of all productive machine-hours and man-hours. With Murphy Diesels you avoid non-productive hours . . . you don't tie up equipment and men by keeping them waiting for power at the beginning of the work-shift or anytime, day or night, because Murphy Diesels start quickly, easily, and can be depended upon for continuous service, as required, 24 hours a day, 7 days a-week, if necessary.

Compact and relatively light in weight, these modern engines are readily portable . . . and also adaptable to mobile equipment. Economical in operation and maintenance, Murphy Diesels assure more power, more profit. Write for bulletin.

MURPHY DIESEL COMPANY
5315 West Burnham Street
Milwaukee 14, Wis., U.S.A.

ARMY NAVY

BUY U.S. WAR BONDS

More Power
MURPHY DIESEL
Reg. U.S. Pat. Off.
More Profit

Engines: FROM 90 to 215 HP
Generators: FROM 60 to 115 KW

"FIELD-PROVEN POWER"

An Important First-Step Toward Postwar
PREVENTIVE MAINTENANCE . . .

Simplify ALL Bearing Loads with

ROLLWAY

RIGHT-ANGLED LOADING

Type MCS
Double Width

PREVENTIVE MAINTENANCE rather than costly repair or replacement will be the rule after the war. In more and more plants . . . on more and more drafting boards . . . ROLLWAY Solid Cylindrical ROLLER BEARINGS will get the nod. That's because Rollway Bearings are always loaded the right-angle way, reducing every load to the magnitude and direction of a single component—either pure radial or pure thrust.

Follow This Basic Bearing Principle:—

- **All radial loads carried at right angles to the roller axis.**
- **All thrust loads carried at right angles to the roller axis.**
- **All compound loads carried on separate radial and thrust bearings—used in combination—as shown in the diagram.**

LOOK at these FACTS!

When load magnitudes go down, higher bearing load capacity, faster operating speed or longer life-expectancy results. Proportionate combinations of all three advantages are possible. The big point is that load pressures per bearing are reduced, lubrication films are maintained and elastic limits of metals are never exceeded due to piling up of compound loads. With the load always carried at right angles to the roller axis, there is no tendency for rollers to wedge or pinch out, hence rubbing friction and roller-end wear-back are reduced. Machine stoppages for bearing replacements or service are less frequent. Manufacturing costs are lower.

- **A wide range of Rollway types in SAE and American Standard Metric Sizes are available for most requirements, eliminating the cost and delay of special tools, patterns and set-ups. Ask for a free Rollway bearing analysis and recommendation. Just send drawings or detailed description. No obligation.**

ROLLWAY BEARING COMPANY, INC., SYRACUSE, NEW YORK

BUILDING HEAVY-DUTY BEARINGS SINCE 1908 — **BEARINGS**

Setting new Records!

Record No. 1: Twin Unit Plant, shown in the photographs, with 10″ x 36″ jaw crusher, and 40″ x 22″ roll crusher. Airport construction job in California, requiring both 1¼″ minus and 2½″ minus. Production for entire job averaged 500 tons per hour, crushing 25%.

Record No. 2: Quarry work in California. Twin Unit Plant with 21″ x 38″ jaw crusher, and 40″ x 22″ roll crusher. Averaging 400 to 450 tons per hour, to 2″ minus, crushing 50%.

Production records like these — never before approached in a portable plant to our knowledge—explain why more and more operators are building their plans for wider and more profitable operations around the Austin-Western Twin Unit Plant. We'll be glad to tell you the whole story of this and other crushing plants. THE AUSTIN-WESTERN COMPANY, Aurora, Illinois.

BUILDERS OF ROAD MACHINERY

Austin Western

SINCE 1859

WHEN YOU CHECK UP ON YOUR PLANT'S PAY-ROLL SAVINGS PLAN FIGURES!

These days, things change with astonishing speed. The Pay-Roll Savings Plan set-up that appeared to be an outstanding job a short time ago, may be less than satisfactory today.

How about checking up on the situation in *your* plant? Checking up to see if everybody is playing his, or her, part to the full measure of his, or her, ability. Checking up to see if 'multiple-salary-families' are setting correspondingly multiple-savings records.

A number of other groups may need attention. For example, workers who have come in since your plant's last concerted bond effort. Or, those who have been advanced in position and pay, but who may not have advanced their bond buying accordingly. Or even those few who have never taken part in the plan at all. A little planned selling may step contributions up materially.

But your job isn't finished, even when you've jacked participation in your Pay-Roll Savings Plan up to the very top. You've still got a job before you—and a big one! It's the task of educating your workers to the necessity of not only buying bonds, but of *holding* them. Of teaching your people that a bond sold before full maturity is a bond robbed of its chance to return its full value to its owner—or to his country!

So won't you start *checking* . . . and *teaching* . . . today?

War Bonds To Have And To Hold!

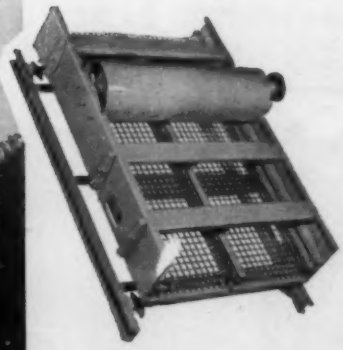
LET'S ALL BACK THE ATTACK WITH WAR BONDS!

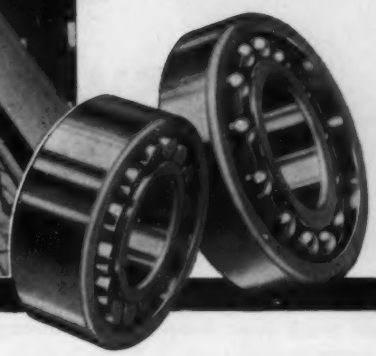
The Treasury Department acknowledges with appreciation the publication of this message by

ROCK PRODUCTS

This is an official U. S. Treasury advertisement—prepared under auspices of Treasury Department and War Advertising Council

Built by
UNIVERSAL VIBRATING SCREEN CO.





Gravel takes a bath *on SKF bearings*

Washing and rinsing gravel over a screen before it goes into railroad cars demands uniform vibratory action over every square inch of screening surface. It also demands bearings that can stand up under the constant shock loads *every day . . . every month . . . every year.* Bearings that don't lose their full capacity while allowing for shaft deflections, distortions or weave. Both of these advantages come to the user of this screen—for the screen's a Universal and its bearings are SKF's. 5557

SKF INDUSTRIES, INC., PHILA. 34, PA.

SKF

ball and roller bearings

SWEETEN YOUR PROFITS
AS YOU SWEETEN FARM LAND
WITH
THORNTON
Automatic-Locking
DIFFERENTIALS

You'll agree that to do a good, thorough job of lime spreading or fertilizing, your truck must keep moving through mud, muck, and over slippery ground conditions.

Maybe you're a contract spreader, or a farm owner or operator. Maybe you have contract schedules to meet, or must keep up with general farm work. In any event you'll take your hat off to a truck in whose rear axle a Thornton *Automatic-Locking* Differential has been installed . . . because both wheels *must* rotate when power is applied.

Watch how the Thornton equipped truck out-performs others that skid, slew or stall. Note how it can back up, or make right or left hand turns. Easily installed . . . And it's really automatic. Find out how farm trucks operate more profitably with the Thornton *Automatic-Locking* Differential. Send for folder today.

Production Models Now Available with Limitation Order Certificate L-158

Model 10G1 for Ford 1½ ton trucks with single speed axles.
Model 20G1 for Chevrolet 1½ ton trucks with single speed axles.
Model 50G1 for International Trucks (Model K-3) with single speed axles.
Model 50G2 for International Trucks (Models K-4 and K-5) with single speed axles.
Model 50J1 for International Trucks (Models K-6 and K-7 or earlier equivalents) with single speed axles.

BUY MORE WAR BONDS

WRITE FOR PARTICULARS AND PERFORMANCE DATA

THORNTON TANDEM COMPANY

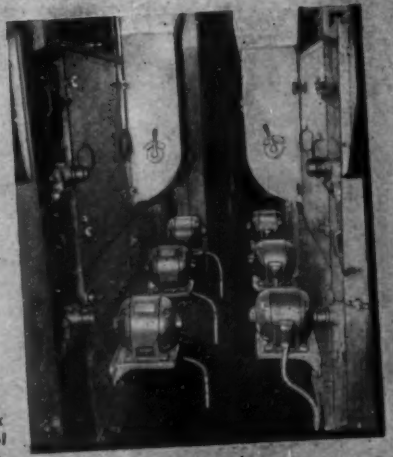
8769-A GRINNELL AVENUE • Plaza 9700 • DETROIT 13, MICHIGAN

Make Big Trucks Out of Little Ones with the THORNTON *Four-Rear Wheel* DRIVE

In U. S.: Sold by TRUCKSTELL DISTRIBUTORS • In Canada: H. V. WELLES, LTD., Windsor, Ont.

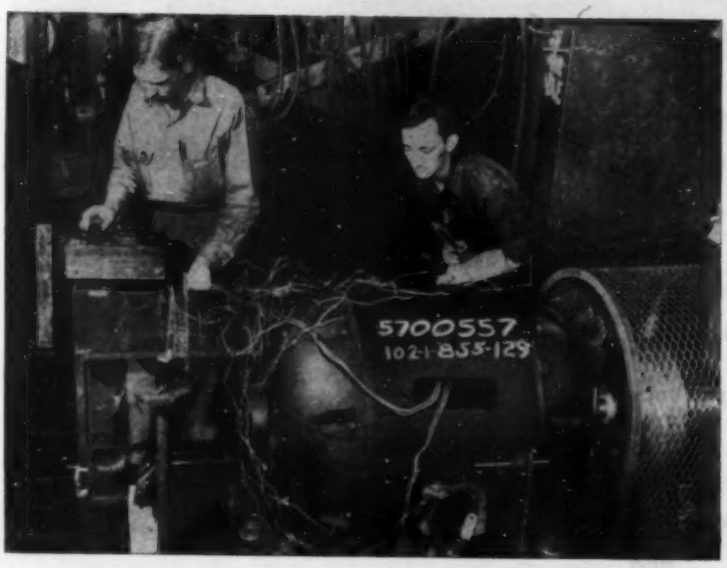
WHEN THE HEAT'S ON

Motor-driven machinery is often called upon to operate under conditions of extreme heat and humidity. For example, the motors on this wool-plant washer must operate in an air temperature of 100° F., with humidity higher than 80 per cent. Conditions like this would shorten the life of any motor lacking effective, performance-tested ventilation design. The double-end cooling system of the Tri-Clad motor helps offset the effects of high ambient temperatures common to heaters, dryers, and many ventilating-fan applications. In addition, motor windings of Formex wire (Class A insulation) are unusually long-lived under total temperatures (ambient plus rise) up to 194 F. For even higher temperatures, Class B insulation offers still greater protection.



G-E Tri-Clad motors applied to Sargent back washers at plant of the Southwell Wool Combing Company, No. Chelmsford, Mass.

Multi-Point Tests on TRI CLAD Motors Tell Temperature Conditions Inside and Out



Dozens of thermo-couples and thermometers at all vital points of this Tri-Clad motor reveal temperatures under a wide range of load conditions. First, tests like this helped to perfect the double-end ventilation design. Now regular tests of Tri-Clad motors taken off the production line verify previously established temperature-rise limits, and ability of insulation to stand up. Continued research along the same lines, including operation in enclosures which restrict air flow, points the way to further improvements in the future. *General Electric Company, Schenectady 5, N. Y.*

GENERAL ELECTRIC

TRI CLAD MOTORS

Every week 192,000 G-E employees purchase more than a million dollars' worth of War Bonds.

Always "on the go," this 2-cycle Diesel tractor 'dozes sand and gravel into truck loading bunkers and hydraulic washing pits, in addition to handling many other jobs.

The tractor has proved a salvation to material handlers in many ways . . . especially during these times of manpower shortage.

That new road you need for bringing in supplies and hauling out aggregate is cut through quickly with powerful, fast-working 2-cycle Diesels. Stripping or cleaning-up work is now handled at the fastest pace in history . . . and at correspondingly lower costs. Especially ideal is the ease with which you clear trees, stumps and debris . . . or move your machinery from place to place.

Tractors are sorely needed on the fighting fronts and for constructing outlying bases. But they are needed in essential industry, too! That's why the government allows 15% of our crawler tractor production for home front use. Consult your Allis-Chalmers dealer about the availability of equipment.

ALLIS-CHALMERS
TRACTOR DIVISION • MILWAUKEE 1, U. S. A.

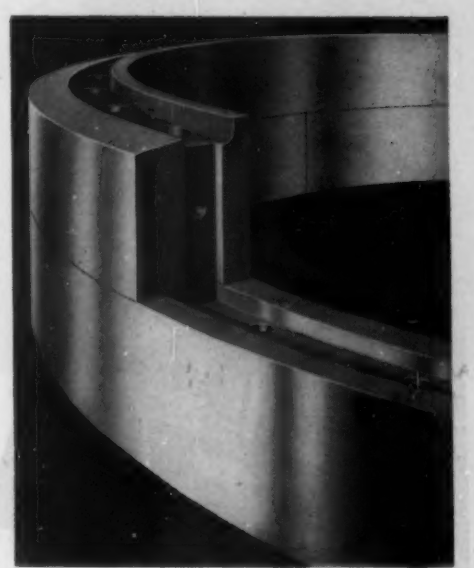
***2-Cycle* THE MODERN DIESEL POWER**

SECTIONAL TIRES FOR ROTARY KILNS often afford IMPORTANT SAVINGS

The one-piece cast-steel tires originally furnished with Vulcan rotary kilns, coolers, retorts, etc., are tough, hard and long-lived but, eventually, must be replaced. To replace a worn or broken tire with another one-piece tire is usually such a difficult and expensive undertaking, however, that most operating executives defer the job as long as possible. Sometimes too long—with disasterous results.

To meet this urgent need Vulcan engineers have developed several types of sectional tires—one of which, as here shown, is especially recommended for heavy-duty installations and guaranteed to give as good results as any one-piece tire of the same size. Many Vulcan sectional tires, of this and other types, have been installed during the past ten years and every one has given perfect satisfaction.

Naturally, Vulcan sectional tires cost more than solid tires of the same size but the saving in installation costs on most replacement jobs is so great that no operating executive can afford to overlook their ultimate economies. Vulcan engineers will be glad to recommend the best type of sectional tire for any given requirement and to help figure out the probable savings that can be achieved through its use.



Close-up of tongue-and-groove joints on Vulcan sectional tire shown above. Bolt-holes through the tire sections are reamed for 2" fitted bolts, with hex and jam nuts, and a dowel pin is used at each of the four end-joints.

VULCAN IRON WORKS

Established 1843

Main Office and Works **WILKES-BARRE, PA.,** New York Office 50 Church

Rotary Kilns, Coolers and Dryers	Toothed, Double-Roll Crushers	Heavy-Duty Electric Hoists	Steam Locomotives
Rotary Retorts, Calciners, Etc.	Heavy-Duty Briquetting Machines	Self-Contained Electric Hoists	Diesel and Gasoline Locomotives
Improved Vertical Lime Kilns	Ball, Rod and Tube Mills	Scraper-Loading Hoists	Diesel-Electric Locomotives
Automatic Quick-Lime Hydrators	Shaking-Chute and Chain Conveyors	Cast-Steel Sheaves and Gears	Electric Locomotives and Larrys

HERE'S THE QUESTION

"IS YOUR SEPARATION PROCESS GIVING YOU MAXIMUM PRODUCTION AND SAVING YOU MONEY?"

If you're not sure of the answer, check the features of the *Sturtevant Air Separator* listed below.

Range of Fineness—40 to 350 mesh.

Capacities—¼ ton to 50 t.p.h.

Mill capacity increased as much as 300%.

Controlled specific surface area.

Lowered mill and product temperatures.

Power Reduction of 10% to 50%.

Sturtevant Air Separators **are the answer to many production problems—the only separators quickly adjustable to an infinite variety of adjustments to meet all requirements and specifications under all conditions.**

All *Sturtevant Air Separators* in the cement industry have been installed "on approval"—none has been rejected. Proof enough that *Sturtevant* is the right answer.

Write for latest bulletin and engineering information now!

STURTEVANT MILL CO.

Harrison Square, Boston 22, Mass.

STURTEVANT

Air Separators **Ring-Roll Mills** **Jaw Crushers**
Crushing Rolls **Swing-Sledge Mills**
Moto-Vibro Screens **Rotary Fine Crushers**

FORTRESS...
AT THE END OF MAIN STREET

Out here at the edge of town there are no screaming dive bombers or "ack ack" fire. Yet, here is a true fortress where much of the strength of our nation lies... in deep open pit mines where limestone, coal, iron ore, copper, and other vital minerals are dug to form the huge bulwark of defense and offense.

Here, too, America is meeting the challenge of Axis power — with the most modern and efficient equipment for large-scale mining the world has ever known. Day and night, the big P&H Electric Shovels are straining steel muscles to answer the cry for more —digging and stripping raw materials with steady speed — *out*stripping enemy capacity with American mass production methods.

Now, these big P&H Electric Shovels and the men who operate them are hastening the day of Victory. When that day comes, their work goes on, in the interest of lower costs per ton in digging raw materials to create more goods for more people at lower cost.

P&H

HARNISCHFEGER CORPORATION

EXCAVATORS • ELECTRIC CRANES • ARC WELDERS P&H HOISTS • WELDING ELECTRODES • MOTORS

4410 West National Avenue

MILWAUKEE • WISCONSIN

Electric Cranes • Electric Hoists • Arc Welders
Excavators • Welding Electrodes

STOODY SELF-HARDENING HALTS SPOT WEAR!

Buckets and dipper fronts invariably wear unevenly, areas receiving greatest abrasion naturally being first to give way. Many shovel users make it a practice to patch worn spots by welding in sections of manganese or high carbon steel plate thus restoring original wall thickness. This procedure is effective, but strictly temporary because manganese plate offers no greater wear resistance than the surrounding metal and will wear away just as rapidly as the original base steel.

These Pictures Tell the Story!

Write for Stoody's pictorial "Specification Sheets." Shows closeups of Stoody Hard-Facing applications on many types of heavy equipment. Tells in few words recommended hard-facing procedures and proper alloy for each type of application. No cost or obligation. Write today!

STOODY SELF-HARDENING PROVIDES THE EXTRA WEAR RESISTANCE NEEDED FOR FAST WEARING SPOTS. Not only is it much harder and more wear resistant than ordinary steel, but it is also tough and will stand severe impact. The way to get maximum shovel efficiency and avoid frequent delay for routine repairs is to hard-face areas where wear is concentrated. Thereafter the abrasion normally causing greatest damage is received by the hard metal and wear is evenly distributed over the entire bucket surface.

Stoody Self-Hardening is very easy to apply and forms a strong bond with manganese steel. It is available both in coated and bare rods for D. C. Electric application and can be purchased through Stoody distributors located in all major cities. 3/16" and 1/4" diameter rods are priced at only $.50 per lb., F. O. B. Whittier, Calif., or distributors' warehouses.

STOODY COMPANY
1129 WEST SLAUSON AVENUE, WHITTIER, CALIFORNIA

STOODY HARD-FACING ALLOYS
Retard wear . . . Save Repair

G. I. finds a friend

G. I. (as the Yank soldier prefers to call himself) has to handle a lot of wire rope these days. On landing barges . . . on cranes, hoists, and power shovels . . . and especially on trucks and tanks, most of which carry an emergency winch cable as standard equipment. For such uses, Bethlehem has supplied millions of feet of wire rope—much of it in our top-quality Form-Set (preformed) construction.

When a truck is mired, or when there's a heavy hauling job to be done, the G. I. winch cable is a friend in need. And when it's supple, easy-handling Form-Set it's doubly a friend. That means a lot to G. I., who as likely as not was a traveling salesman or grocery clerk in civilian life, and had no experience in handling wire rope.

Because its strands and wires are preformed in their corkscrew shape, Form-Set is free from locked-up constructional tensions. It's easy to splice and spool, requires no seizing, and sprouts no spiny wire bristles to slash the hands of men who work with it. All of which explains why Government agencies have bought it in such vast quantities for military operations.

You get the utmost in service and long life from Form-Set when it's in the Purple Strand grade. Purple Strand wire rope is made of strong, tough Improved Plow Steel, the highest-quality steel that's used in wire-rope construction.

In Form-Set Purple Strand you get the ideal combination of preformed ease of handling with the unmatched strength and ruggedness of Improved Plow Steel. Plan to order it for your next wire rope job, or for replacements. But make your plans, please, as far in advance as possible, so that you will be sure to have Form-Set Purple Strand Wire Rope when you need it.

Form-Set
Purple Strand
Wire Rope

★ ★ ★ ★ BETHLEHEM STEEL ★ ★

LAY·SET *Preformed* IS RELIEVED

course, this analogy is far-fetched but it is still true that the wires and strands of non-preformed wire rope are virtually locked in position—under constant stress—uncomfortable—cranky. Being so, non-preformed cannot work so well, nor long, as Hazard LAY-SET, which is preformed at the mill and entirely relieved of internal torsional stresses and strains. LAY-SET Preformed wire rope gives you greater dollar value, requires no seizing when cut; it resists kinking and whipping; it is easier to splice and safer to handle. And, invariably, it wears longer.

Ever since Pearl Harbor, and even before, Hazard LAY-SET Preformed has been saving time and money for the Government, the Armed Forces, and the taxpayer.

Specify Hazard LAY-SET Preformed for *all* its built-in advantages.

HAZARD WIRE ROPE DIVISION • Wilkes-Barre, Pa., Atlanta, Chicago, Denver, Fort Worth, Los Angeles, New York, Philadelphia, Pittsburgh, San Francisco, Portland, Tacoma

AMERICAN CHAIN & CABLE COMPANY, INC. • BRIDGEPORT • CONNECTICUT

HAZARD LAY·SET *Preformed* WIRE ROPE

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ROCK PRODUCTS

TRADEPRESS PUBLISHING CORPORATION • 309 W. JACKSON BLVD., CHICAGO, 6

SELL THE FARMER!

We hear and read so much about the prospects for post-war construction business that there might be a tendency to overlook, or minimize, markets that exist now. No one knows how long the war will last and, in the interests of self preservation, many construction businesses should make capital of the favorable markets remaining for the duration.

We doubt that many producers of ready-mixed concrete or aggregates have ever looked with much enthusiasm upon the farmer as a prospect for construction materials. Each farmer is a relatively insignificant prospect but, taken collectively, farmers will purchase millions of dollars worth of construction materials. Many producers will miss a bet if they fail to recognize the farmers' construction needs. In many areas it would be possible to develop sufficient farm business to keep an operation going until the war clouds blow over and permit the resumption of "normal" construction. In others, sales to farmers could supplement a depressed volume of general construction business to make a respectable total.

Why the Farm Market?

Farming is our nation's biggest industry and farmers are the "fair-haired boys" of this war. They are prosperous and restrictions on building expenditures they make are much less severe than those which regiment other classes that make up our nation. Food is a war material and farm buildings are classified as war equipment by the War Food Administration.

Food production is counted upon to smash all records in 1944, and something like 380 million acres will be planted to reach the goal. Peak production will require adequate storage buildings to accommodate the crop increases, to shelter and preserve crops and for the protection of farm animals and equipment. Authorities have recognized that as much as 25 percent of many crops is lost annually through spoilage, due to inadequate housing for grain and livestock. For these reasons, the farmer needs no approval (or he can get it easily) for essential repair and maintenance of his farm buildings and he can get approval to build certain necessary new structures.

Size of the Market

It has been estimated by authorities that we have 6½ million farms in this country and that they have an average of eight buildings each. If we assume that half of these farmers will each spend $250 a year for construction, which certainly is a conservative amount, there is an 800 million dollar repair bill. Farmers spent 665 million dollars for construction in 1942 and about one-third as much in each of the depression years.

Farm buildings are, generally speaking, in a run-down condition and many are just plain dilapidated. The depreciation of farm structures has far exceeded the maintenance put into them since the last war. It would be a service to the farmers to help them to build permanent types of essential buildings and permanent improvements to run-down structures.

Kinds of Buildings

To some producers, accustomed to heavy orders for large construction projects, the construction or reconversion of hog houses, milk houses, poultry houses and barns does not have much appeal but we emphasize that a lot of small orders can run into an appreciable volume, at least in some areas.

These buildings should be built, or rebuilt, of fireproof construction since the annual loss by fires on farms is terrific. The walls might be built of concrete masonry, which will represent many thousands of tons of aggregates. With the scarcity of lumber and the prices asked for it, such masonry materials are in a very favorable competitive position.

All these buildings need floors, which could be conveniently poured from ready-mixed concrete trucks. And under these floors, agricultural agents frequently recommend sub-bases of either gravel or crushed stone aggregate in their approved designs. Hog-feeding floors, barnyard floors and permanent concrete foundations built under old barn structures offer possibilities for considerable yardages of concrete. These kinds of essential construction require no priorities.

In many communities we believe that a reasonably large ready-mixed concrete operation could develop a sufficient volume of farm business to keep it going. We know of instances where a batching plant, in a farm community, has operated continuously at a profit while keeping just one mixer truck in operation.

Around metropolitan areas, there are usually a number of outlying farms that can be reached within a reasonable hauling range. Judging from the experience of operating a single transit mixer unit profitably, by producers we know of, it isn't inconceivable that batching or transfer plants could be set up within a farming area to serve farms within a 25-mile area, particularly if a backlog of business is first developed.

In concluding, we would suggest that consideration might be given to an advertising program directed to the farmers and, possibly, a direct mail program. Weekly county papers are good media and mailing lists are available from county agents, dealers, bankers, rural papers and other sources.

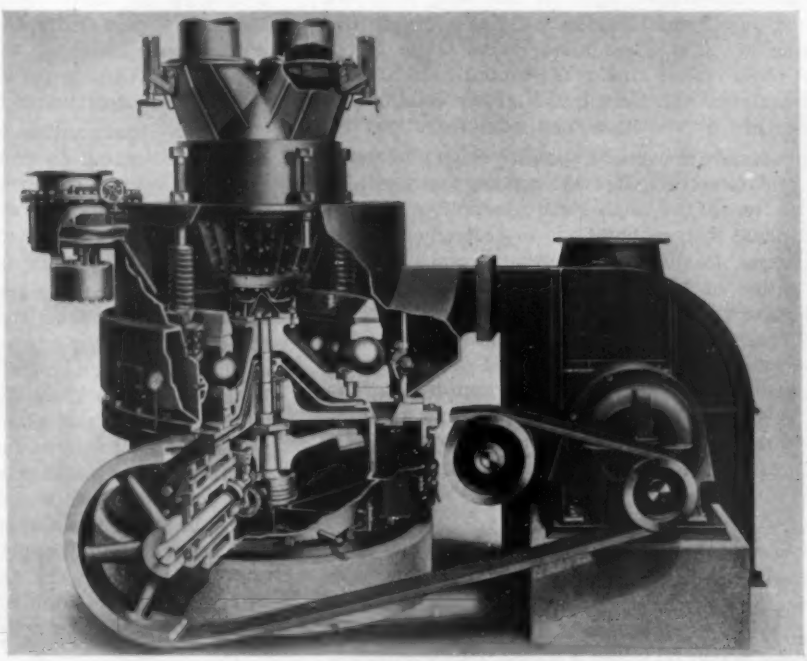
Bror Nordberg

A FORWARD LOOK

COAL stands supreme as the economical fuel for firing cement kilns. About 85 per cent of the cement produced in this country is burned in kilns fired with pulverized coal; direct firing accounts for approximately 40 per cent of the total production.

In post-war days, there will unquestionably be a considerable increase in the use of direct firing equipment. For overall economy, and generally satisfactory performance, the B&W Type E Pulverizer is the logical choice for this purpose.

THE BABCOCK & WILCOX CO.
85 LIBERTY ST., NEW YORK 6, N. Y.



C-56

BUY MORE WAR BONDS!

BABCOCK & WILCOX

★ ★ ★ Washington NEWS

AUTHORITY to increase cement prices up to 20c a barrel has been granted by the Office of Price Administration, through Amendment 6 to Maximum Price Regulation 224, effective April 20. The authority for this increase has been extended to all cement manufacturers located outside that area but shipping into the area:

All New England States.

The State of New York.

The Counties of Potter, Clinton, Center, Huntington, and Franklin in Pennsylvania, plus all Counties in Pennsylvania located east of the named Counties.

New Jersey.

Delaware.

Maryland.

The District of Columbia.

The City of Alexandria, Virginia, and the following Virginia Counties: Loudoun, Arlington, Fairfax, Prince William, and Stafford.

According to Executive Secretary V. P. Ahearn of the National Ready Mixed Concrete Association, the O.P.A. order does not carry any direct relief for ready mixed concrete producers located in the affected area, notwithstanding that a price increase of 20c per bbl. would result in an increased cost per cubic yard of concrete of 25c to 30c or more depending upon the quality of the concrete. The association called a meeting of ready mixed concrete producers in Washington, D. C., on April 28 to discuss with O.P.A. what measure of relief individual producers may obtain to meet this increase in cement prices.

Lift Railroad Construction Restrictions

W.P.B. amendment to Preference Rating Order P-142: Under this amendment, effective April 19, restrictions were lifted on the construction of certain railroad operating facilities, such as tunnels, overpasses, underpasses and bridges not exceeding $2500 in cost of materials. This action relieves railroads from certain provisions of Conservation Order L-41. Railroad operators may acquire the exempted amount of materials either by placing new Maintenance, Repair and Operating Supplies orders under P-142 or they may withdraw this quantity of materials from priority-obtained inventories. With respect to any project costing over the above limits, after the operator gets specific authorization in writing from W.P.B. he may withdraw amounts over those limits from his inventory of materials acquired with priorities assistance. However, replacement in inventory of any additional materials so withdrawn may be made only by using the ratings and allotments assigned by the specific authorization ICMPL-224, GA-1456, or other applicable form. This new order may open up new avenues of business for cement and aggregates.

Clarify P-56 Amendment

Executive Secretary V. P. Ahearn of the National Sand and Gravel Association has sent out a letter to the membership clarifying P-56 as amended April 5. He emphasized that procedure for establishment of allowable quota purchases is substantially different for producers with mine serial numbers as contrasted with producers without mine serial numbers.

For producers holding serial numbers, in order to determine what the quota amounts to in dollars, the like calendar quarter in 1943 should be studied and every purchase made for maintenance, repair and operating supplies, controlled materials, and minor capital additions, whether rated or not, or whether the allotment number was used or not should be included. Coal, fuel oil, lubricating oil, explosives, bought electric power, water, etc., are figured for the dollar value. Everything used as an operating expense or minor capital addition is figured, except salaries and wages.

There are no restrictions as to what this dollar value quota is spent on, except that no purchase order for minor capital addition can be over $500. This means that the whole amount can be used for rated orders, or unrated orders, or the whole amount can be used for controlled materials. Capital items costing over $500 must be applied for on Form WPB-1319 filed with the Mining Division, War Production Board, Washington, D. C.

There is nothing in the order to prevent placing orders for delivery as far in advance as desired. However, the base figure for the like calendar quarter of 1943 must be known and not exceed the 120 per cent. CMPL-578 is practically obsolete, since it was issued before P-56 was amended and is therefore based on discarded provisions of the old order.

Deductions from quotas should be made on the basis of the anticipated delivery date. Orders for delivery in one quarter, on which no delivery is made until a later quarter, should still be charged against the quota for the quarter in which delivery was originally anticipated.

If the total allowable purchases for the second quarter of 1944 on the basis of the 120 per cent factor is insufficient, advantage should be taken of the provisions of paragraph (m) of P-56 and submit a written application to the Mining Division, in triplicate, asking for the additional dollar value quota which may be needed. Reasons why such further assistance is essential must be given. Emergency applications may be made by telegraph or telephone.

In the case of any producers not holding serial numbers they have an AA-5 rating for maintenance, repair and operating supplies and minor capital additions. They were assigned an allotment number of S-7 for controlled materials. These producers arrive at their base figures in exactly the same manner as described for the serial number holders and have the same privilege of 120 per cent of the dollar value of purchases made for the like calendar quarter for 1943. These producers may spend the entire amount, if they please, for maintenance, repair and operating supplies, but they are not permitted to purchase beyond 120 per cent of the same amount of controlled materials that was used during the 1943 base quarter. They also have the privilege of placing advance purchase orders.

If a producer not holding a serial number requires a higher rating than AA-5 for maintenance, repair and operating supplies, exclusive of minor capital additions, he must file Form WPB-2910 with the Mining Division. For minor capital additions on which he needs a rating higher than the AA-5 assigned or for capital additions costing more than $500, file Form WPB-1319 with the Mining Division. Additional quotas may be had for non-serialized mines by filing a letter in triplicate with the Mining Division and emergency assistance can be had by telegraph or telephone in the same manner as prescribed for producers holding serial numbers.

Gypsum Board Prices

O.P.A. amendment 31 to Order A-1, MPR 188: This amendment modifies maximum gypsum wallboard, lath, sheathing prices of manufacturers for products destined for use in California, Arizona, Oregon, or Washington. The sale must be made to the War Department, the Navy, the Maritime Commission, the Federal Public Housing Authority or the Federal Works Agency. It may also be sold to any building material dealer holding a priority rating of AA-3 or higher for any of the foregoing agencies or

(Continued on page 96)

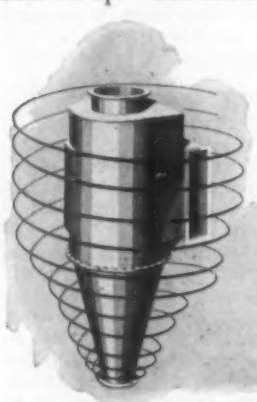
No. 4 Reason for

Buell's High Efficiency, Low Maintenance, Long Life

•THE NEED for correct hopper designing is a most important one in considering the final efficiency of a dust collection installation. Its slope must be dependent upon the type of dust to be collected . . . must be sufficiently great to overcome the "angle of repose" in the dust accumulation. And the overall design and specifications must give facility of disposal operation. For when dust bins fill up — dust collection ceases.

That's why Buell Dust Recovery Systems are custom built to meet individual requirements. And that's why all Buell installations are *designed to do a job — not just to meet a 'spec.'*

BUELL ENGINEERING COMPANY, INC.
Suite 5000, 2 Cedar St., New York 5, N. Y.
Sales Representatives in Principal Cities



Engineers will find substantiation of these claims in Buell's factual, 28-page book — "The von Tongeren System of Industrial Dust Recovery." Ask for Bulletin G-842.

buell
DUST RECOVERY SYSTEMS

BUELL FEATURES	RESULT IN	PRODUCE
SHAVE-OFF LARGE DIAMETERS	HIGH COLLECTION EFFICIENCY	GREATER RECOVERY
EXTRA-THICK METAL	LESS FAN BLADE WEAR	LOW MAINTENANCE
LARGE OUTLETS	LOW DRAFT LOSS	LOW OPERATING COST
INNER WELDS GROUND SMOOTH	LOW POWER CONSUMPTION	LONG LIFE
CORRECTLY DESIGNED HOPPERS	HIGH TEMPERATURE RESISTANCE	NO CLOGGING
SPLIT-DUCT MANIFOLDS	UNLIMITED CAPACITY	
	NO MOVING PARTS	
	FREE DUST FLOW	

DESIGNED TO DO A JOB, NOT JUST TO MEET A "SPEC"!

Rocky's NOTES

LAST NOVEMBER, at the Industrial Minerals Division meeting of the American Institute of Mining and Metallurgical Engineers, an elderly gentleman sat down beside me in the lobby of the Du Pont Hotel, Wilmington, Del. After some conversation which turned on the cement and allied industries, he introduced himself as Edward N. Trump, of Syracuse, N. Y., and Merion, Penn. Mr. Trump, as probably many readers know, has been a prolific inventor of machinery for the basic chemical industries, having served for many years as chief engineer and consulting engineer for Solvay Process Co.

Mr. Trump is in his 87th year and has been inventing things since 1879. Being interested in engineering history—a hobby of 30-odd years' standing—I picked up from Mr. Trump a forgotten chapter in the history of the portland cement industry. Those who have read the late Robert Lesley's "History of the Portland Cement Industry in the United States," may recall that he mentions the Warner Cement Co., Warner, 10 miles west of Syracuse, N. Y., on p. 91.

Mr. Trump's recollections about this plant are as follows (subsequently sent me in the form of a memoranda with the accompanying sketch):

"There was found a deposit of marl and clay and a cement kiln was in use for many years before 1880. The mixture of marl and clay was made into bricks, stacked and burned to clinker and the cement was a good quality.

"The writer, when visiting England, heard in 1885 of an experimental rotary furnace which was being tried. A group of Syracuse men formed the Warners Portland Cement Co. and the writer designed in 1885 a set of rotary furnaces, 6 ft. diameter of shell, with dryers behind them to use the waste heat to dry the wet marl and clay. Three dryers were used for the marl and one for the clay, receiving the heat from the four furnaces in front. The sketch shows the arrangement installed in 1889.

"Conveyors received the clay and marl from the dryers and elevated them to bins; mills and mixers proportioned the dried clay and marl, which were conveyed back to the furnaces, fired with oil. This process made very good portland cement.

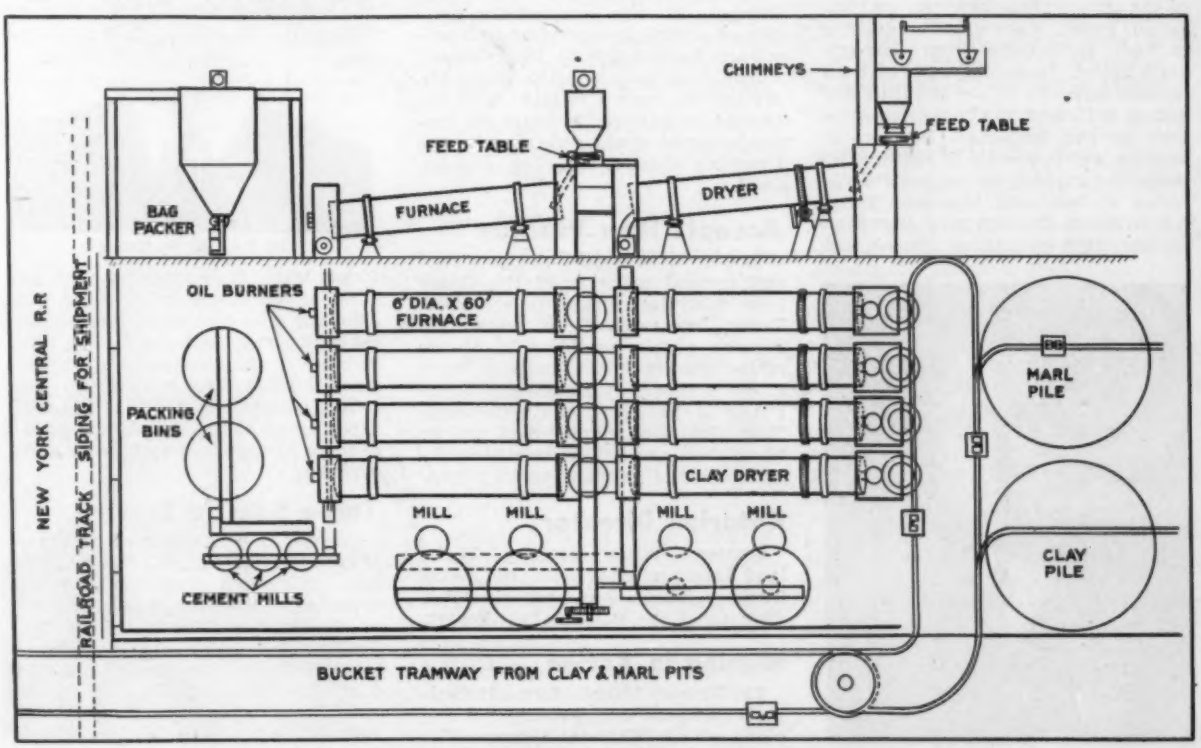
"The clinker was ground in vertical roller mills.

"The de Navarro brothers (of Atlas Portland Cement Co. fame) were trying a single rotary furnace at the same time.

"We had an unfortunate fire, which burned down the whole mill. Our chemist, S. B. Newberry, went to Sandusky and started another plant, which was the forerunner of the many cement plants in Michigan and Ohio (Sandusky Cement Co., now Medusa).

"The single furnace for dryer and sinterer with the great increase in over-all length was much more efficient and economical of fuel. Better feed devices proportioned the marl or ground limestone and clay. Powdered coal was also tried alongside the oil. A bucket tramway over the railroad tracks from the marl and clay beds was constructed. We believe this was the first successful rotary furnace cement plant in the United States."

Nathan C. Rockwood



Floor and elevation plans of one of the earliest rotary kiln cement plants built in the United States

News ABOUT THE INDUSTRY AND PEOPLE

Succeeds Retired Research Director

GEORGE L. LINDSAY, assistant director, Universal Atlas Cement Co., Chicago, Ill., has been appointed director of tests and research, succeeding O. L. MOORE, who is retiring after 30 years of service with the company.

George L. Lindsay

Mr. Moore joined the Universal Atlas Cement Co. in 1914 as foreman in the physical laboratory at the Universal, Penn., plant after graduating in civil engineering from Carnegie Institute of Technology. In 1916 he became inspector at the Duluth plant and in 1917 went to Chicago as engineer in the Inspection Bureau. In 1926 he was promoted to engineer of tests, and in 1937 was appointed director of tests and research. Under his direction the company improved its technique of testing cement and developed air-entraining portland cement for use in fortifying concrete pavements against freezing and thawing weather. He also directed research leading to a standard method of test for determining the amount of entrained air which is the key to the proper performance of air-entraining portland cement. He is a member of the American Concrete Institute and of the American Society for Testing Materials.

O. L. Moore

Mr. Lindsay long has been associated with Mr. Moore. He worked at the Duluth plant on construction, in the physical laboratory, and as a cement tester during several vacation periods before and after entering the University of Minnesota to study chemical engineering. Upon graduation in 1921 he rejoined the company as a chemist at Duluth, and in 1925 moved to Chicago where he successively served as engineer, Inspection Bureau, and engineer of tests. In recent years he held the position of assistant director of tests and research. He is a member of the American Society for Testing Materials and of the American Concrete Institute and its Committee 714.

Goes to Puerto Rico

THOMAS F. MULLAN, recently assistant manufacturing research engineer for the Portland Cement Association, Chicago, Ill., has accepted the position of technical supervisor and consultant for the Puerto Rico Cement Corp., Guaynabo, Puerto Rico. Mr. Mullan has been associated with the cement industry for 24 years and formerly served as chief chemist for the Riverside Cement Co., Los Angeles, Calif.

Accepts New Position

FRANK E. NABERS, vice-president and general manager of the Gager Lime Manufacturing Co., Sherwood, Tenn., has resigned to accept the position of vice-president in charge of engineering of the Southern Ferro Alloys Company, Chattanooga, Tenn. FRANK M. FERGUSON of Chattanooga, Tenn., has been employed to replace Mr. Nabers and will assume his position with the company about May 1.

Rotarian Director

GEORGE S. WILBUR, president, Highland Sand and Gravel Co., Inc., West Roxbury, Mass., has been elected a director of the Rotary Club, Boston.

Missing in Action

LT. RICHARD MARTIN, formerly quality supervisor at Newburgh, N. Y., plant of the National Gypsum Co., has been reported missing after a raid over Germany. He was last seen parachuting down from a crippled B-17 Flying Fortress over Germany. Mr. Martin started to work for National Gypsum Co. in 1937, after attending Alfred University. He was in the research laboratory at Clarence Center, N. Y., until 1940, when he was sent to the Newburgh plant as quality supervisor and safety supervisor. On January 6, 1943, he enlisted in the Army Air Forces. He was graduated from navigation school and commissioned at San Marcos, Texas. Mr. Martin underwent combat training at Harvard, Neb., and in November, 1943, was sent to England and assigned to the Eighth Air Force.

In the Navy

LT. (J.G.) R. W. KIMMEL, U.S.N.R., has recently been assigned to his second post in the South Pacific. Son of Alfred W. Kimmel, president of the Ready Mixed Corp., Dayton, Ohio, Lt. Kimmel did research work for this company after receiving his mechanical engineering degree at Purdue University. He was commissioned an Ensign, U.S.N.R., over a year ago and took a post-graduate course in naval architecture at the U. S. Naval Academy at Annapolis before being sent overseas.

Lt. (j.g.) R. W. Kimmel

Three Sons in Service

DWIGHT D. GUILFOIL, vice-president of Sauerman Bros., Inc., Chicago, Ill., has contributed three sons to the armed services—John, now a prisoner of the Japs in Mukden; Staff Sgt. William, tailgunner of a B-17, missing in action over northern Italy, and Staff Sgt. Dwight D., Jr., now in the Army and Navy Hospital in Hot Springs, Ark., both legs paralyzed from polio.

Elected President

WILLIAM S. GILES has been elected president of the Iron City Sand and Gravel Corp., Pittsburgh, Penn., and the Ohio River Sand and Gravel Corp., Parkersburg, W. Va., producers, dredgers, and distributors of river sand and gravel, and the Vang Crushed Stone Co., Pittsburgh, Penn., producers of crushed stone for railroad ballast and highway construction purposes. Mr. Giles has been in this industry for many years and has a wide acquaintance in the construction materials field.

N.I.A.A. Vice-President

ALFRED P. DARCEL of Crane Ltd., Montreal, Canada, has been appointed a vice-president of the National Industrial Advertisers Association, according to an announcement by the N.I.A.A. president, Frederic I. Lackens, The Hays Corp., Michigan City, Ind. Mr. Darcel will complete the term of John A. M. Galilee, who has resigned. Formerly with Canadian Westinghouse Electric & Manufacturing Co., Ltd., Mr. Galilee is now associated with Maclean Publishing, Ltd., Toronto, Ont., Canada.

Named Asst. Manager

W. O. LAWRENCE, JR., previously plant engineer at the Leeds, Ala., plant of the Universal Atlas Cement Co., has been made assistant plant manager.

Member of Mining Board

WILLIAM WALLACE MEIN, JR., vice-president, Calaveras Cement Co., San Francisco, Calif., has been appointed a member of the California State Mining Board. Other members of the board are Philip R. Bradley, Jr., Pacific Mining Co.; F. C. Van Deinse, president, Gold Producers of California and general manager of Yuba Consolidated Gold Fields; William C. Browning, manager, Golden Queen Mining Co.; and George W. Hallock, president, California Hydraulic Mining Association.

William Wallace Mein, Jr.

Honor A.I.M.M.E. President

CHESTER ALAN FULTON, president, Southern Phosphate Corp., Baltimore, Md., and sixty-first president of the A.I.M.M.E., was honored at the annual President's Night dinner dance in Chicago on May 6. Noted especially for his world-wide work in phosphate, Mr. Fulton's early professional work included metal mining assignments in the United States, Mexico, Central and South America. He has been active in the Institute for many years, having served in the past as a director and a vice-president. In 1937 he was chairman of the Industrial Minerals Division, and he has been chairman of the Admissions Committee and of the Papers and Publications Committee. Louis Ware, president, International Minerals and Chemical Corp., Chicago, Ill., acted as toastmaster for the evening.

A.I.M.M.E. Chairmen

H. A. REICHENBACH, general superintendent, Nazareth Cement Co., Nazareth, Penn., has been appointed chairman of the Cement, Lime and Gypsum Committee of the American Institute of Mining and Metallurgical Engineers. R. B. LADOO, consulting mineral engineer of Newton, Mass., has been made chairman of the Fall Meeting Committee, and A. G. STERN, chemical engineer of the U. S. Bureau of Mines, Washington, D. C., has been named chairman of the new Western Committee.

In the Service

DAVID S. GIFFORD, secretary and treasurer, Nickel Plate Sand and Gravel Co., Erie, Penn., has been inducted into the armed services.

•

LT. FRED MCCANLESS, JR., son of W. F. McCanless, owner of the Ornamental Stone Co., Charlotte, N. C., is a member of the 5th Troop Carrier Squadron, Grenada Army Air Base. He has been in the service since December, 1942.

•

LT. CLYDE REED, JR., who operated two sand plants in Asheville, N. C., before joining the Army, has been in service 18 months and in England for the past seven months.

•

F. D. PEPPER, who operated a concrete block plant in Winston-Salem, N. C., is now a captain in the Army and is stationed in the Pentagon Building, Arlington, Va.

Col. Dixon Chubbuck

Commands Base

COLONEL DIXON CHUBBUCK, vice-president of the Chubbuck Lime Co., Los Angeles, Calif., is now Commanding Officer of the Base Echelon, Alaska Division, Seattle, Wash. Col. Chubbuck was manager of the company's San Francisco office when he entered the U. S. Army in 1941 as a captain.

Mica Branch Manager

E. J. WEMLINGER will be in charge of the Los Angeles, Calif., office of the Colonial Mica Corporation, which it is reported they are planning to open. He was formerly in charge of the Santa Fe, Mexico, office which has been discontinued.

Joins Advertising Co.

D. R. COLLINS, formerly with the Portland Cement Association and better known as "Spec," has been elected vice-president of Mitchell-Faust Advertising Co., Chicago, Ill.

Becomes Chief Chemist

E. P. NEWHARD, superintendent of the Clinchfield, Ga., plant of the Pennsylvania-Dixie Cement Corp., has been promoted to the position of supervising chemist, with headquarters at Nazareth, Penn. In his new position, Mr. Newhard will exercise control over the processes employed in all the plants of the company insofar as they affect the quality of the product. He will also direct the research work of the laboratories. S. G. McAnally will succeed Mr. Newhard as superintendent of the Clinchfield plant. Mr. McAnally is a graduate of the University of Glasgow, Scotland, and has had many years of experience in the operation of cement plants in the United States and in Brazil.

Southern Aggregates Leases All Its Properties

SOUTHERN AGGREGATES CORPORATION, Raleigh, N. C., has decided on a policy of leasing all operating properties owned by it and also all allied or subsidiary corporations.

Woodleaf Quarry has been leased to M. N. Hedrick, who has associated with him some of his brothers, and is operating under the firm name of Woodleaf Stone Co. The Blair Quarry has heretofore been operated by the South Carolina Granite Co. and was leased to J. M. Gregory, Raleigh, N. C., who incorporated Blair Quarries, Inc. This corporation took over the office of South Carolina Granite Co., Columbia, S. C. D. E. Saunders, who has been with the Blair Quarry since its development was started in 1927, is interested in Blair Quarries, Inc.

The Rolesville Granite Quarry, Garysburg and Lillington sand and gravel operations, and the Goldsboro, Kinston and Aberdeen sand pits (all formerly operated by Bryan-Monroe Co., Inc.) and the Wilson and Rockton Granite Quarries and the shell lime rock deposits near Belgrade, N. C. (formerly operated by Southern Aggregates Corporation), have been leased to James E. Bryan and G. D. Monroe, operating under the firm name of Bryan-Monroe Company.

The Greystone Quarry has been leased to M. N. Hedrick, C. H. Wolfe, and H. D. Hedrick, operating under the firm name of Greystone Granite Quarry. Their principal office will be at Greystone, N. C. M. N. Hedrick will divide his time between his Piedmont Quarries at High Point and Winston-Salem, N. C., Woodleaf, and Greystone.

Lime Plant Improvements

NATIONAL LIME & STONE CO., Findlay, Ohio, has announced improvements costing $60,000 to be made at the company's Corey, Ohio, plant. The money will be spent for improvements to better the working conditions of the employes. The shop will be equipped with new machine tools and an electric traveling crane to eliminate heavy lifting. Dust control equipment also will be installed. L. G. Love, general manager, stated that the money for the improvements has been appropriated and the work will start as soon as materials can be delivered.

Yosemite to Liquidate

YOSEMITE PORTLAND CEMENT CO., Merced, Calif., will cease operation and liquidate if the stockholders uphold the decision of the board of directors. The reason for the decision is the prospect that Yosemite Valley Railroad will probably cease operations in the near future, and the railroad is the sole economic means of transportation between the Merced plant and its quarries. The quest for a new source of limestone was stated in the annual report to have been unavailing. If the sale of properties is consummated there will become available for distribution to the holders of preferred stock an amount per share substantially in excess of the present market price. Directors, however, hold out no hope that there will be any assets available for distribution to the holders of the Class A and B common stock. Although the cement company reported a net income of $131,496 for 1943, it warned of impending difficulties over its transportation situation. It also pointed out a sharp decline in cement demand.

Contract Awards

ESTEY SAND & GRAVEL CO., Troy, Ohio, has been awarded the contract to furnish a year's supply of sand and gravel for the city of Troy on a bid of $3,665.25.

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THE BOWSMAN WASHED SAND & GRAVEL CO., Troy, Ohio, was given a contract by the city of Troy to furnish bituminous material at a bid of $12,230.25.

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STURM AND DILLARD CO., Columbus, Ohio, will furnish the city of Circleville, Ohio, with crushed gravel at $1 a ton at the washing plant. Forty percent crushed gravel will cost the city 80c a ton at the washing plant with 30c a ton added for delivery.

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QUILLEN BROS. CONSTRUCTION CO., Lodi, Ohio, has been awarded a contract from County Commissioners to furnish sand and gravel for county purposes from April 1 to December 31, 1944. For No. 6 gravel a price of $1.20 per cu. yd. was quoted, and the same figure for No. 46 washed and crushed gravel. Concrete sand will be supplied for $1 per cu. yd.

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BOONE COUNTY, IOWA, Boone, Iowa, has asked for bids involving 48,200 cu. yd. of gravel.

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STORY COUNTY, IOWA, Nevada, Iowa, has asked for bids on 44,000 cu. yd. of maintenance gravel.

To Operate Quarry

D. E. MINTON CONSTRUCTION AND MANUFACTURING CO., Parsons, Kans., plans to operate the former Hardman quarry to produce agricultural limestone and other crushed stone products. D. E. Minton, head of the company, is mayor of Parsons, Kans. The Hardman quarry and crushing plant ceased operations in 1942, and Ray Hardman left Parsons to go to Beaverton, Ore. J. M. Hardman, his father who died in 1922, founded the company in 1897.

Build New Block Plant

THE CONCRETE PRODUCTS CO., Anniston, Ala., has built a new plant for the manufacture of concrete masonry units. A Stearns block machine is used, and block have been made for several months. New low-pressure curing rooms are now being built.

Idaho Phosphate Plant

CONSTRUCTION is under way on the $1,000,000 super-phosphate plant at Pocatello, Idaho. J. R. Simplot is financially interested in the enterprise.

Constructing an airport in China under the direction of Chinese and American army engineers. Note the primitive hand-operated screens and method of transporting materials. In the foreground a clay slurry is being prepared as binder for the "macadam" runway pavement

Kaiser Buys Gravel Concern

GLACIER SAND AND GRAVEL CO., Seattle, Wash., has been purchased by the Permanente Cement Co., Oakland, Calif. A. A. Dresser, the new manager of the Glacier concern, in commenting on the purchase, said, "Purchase of the Seattle firm is the initial step in its program of providing distribution for Permanente cement in the Seattle areas. Silos for handling bulk cement to be shipped in by boat will be constructed as soon as materials and manpower are available." Officials of the new Seattle company will be J. A. McEachern, president; E. E. Trefethen, Jr., vice-president; L. S. Corey, treasurer, and G. G. Sherwood, secretary. The new board of directors will be composed of Henry J. Kaiser, L. S. Corey, E. E. Trefethen, J. A. McEachern, Edward H. Heller, Gil J. Shea, and Harry W. Morrison.

Jackson Dam Contract Award

HAROLD EASTERLY of Denver, Colo., has been awarded the contract for processing and hauling sand and gravel for the construction of the outlet works and concrete cut-off wall on the Jackson gulch dam near Mancos, Colo. Mr. Easterly's bid was $44,000. The contract involves the hauling of 4700 cu. yd. of sand and the processing and hauling of 2500 cu. yd. of crushed gravel. The material will be secured from a point about 2½ miles north of Shiprock, Colo.

Agstone Contracts

COLUMBIANA COUNTY, Ohio, A.A.A. committee has announced through Clifford F. Shaw, chairman, Lisbon, Ohio, that contracts have been awarded for the delivery of agricultural limestone on the 1944 program. Prices for agstone dumped on the field range from $2.85 to $4.25 a ton, depending on location. A contract has been placed with Standard Slag Co., Youngstown, Ohio, for agricultural slag. Prices delivered to the field range from $2.32 to $3.65 a ton.

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RICHLAND COUNTY, Ohio, A.A.A. has contracted with National Lime & Stone Co., Findlay, Ohio, and George Yeager, Greenwich, Ohio, for 7000 tons for the agricultural liming program. Prices range from $2.25 a ton to $3.20 a ton. An additional cost of from 40 to 60c a ton is made for spreading the lime on the fields.

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MAHONING COUNTY, Ohio, A.A.A. has contracted with the Carbon Limestone Co., Hillsville, Penn., for 23,125 tons of agricultural limestone as an initial supply. New Castle Lime & Stone Co., also are reported to have received a contract at $2.10 a ton f.o.b. quarry. Carbon Limestone Co., quarry billing price also is $2.10 a ton.

California Dolomite Production

DOLOMITE OUTPUT in California for 1943 was 331,251 net tons, valued at $472,756. This production came from two properties in Monterey County and one each in Los Angeles, San Benito, and Tuolumne counties. The 1943 production was the largest annual yield on record in this State. The 1942 production amounted to 142,552 tons.

President Signs Highway Bill

PRESIDENT ROOSEVELT signed a bill on April 4 which authorizes appropriations up to $200,000,000 for defense highway projects, such as access roads to military and naval establishments. The Act provides that $5,000,000 be earmarked to care for damage to highways as a result of military maneuvers.

Consolidated Expands

CONSOLIDATED ROCK PRODUCTS CO., Los Angeles, Calif., has placed its new Chapman No. 12 portable plant in production. This plant is located approximately a mile down the river from the old Orange plant. The portable plant, with a capacity of 200 tons an hour, was installed to produce material for certain military construction projects.

A major reconstruction program also is going forward at the Orange County plant No. 14.

COMING CONVENTIONS

Concrete Pipe and Products Association, Seattle, Wash., Annual meeting, June or July, 1944.

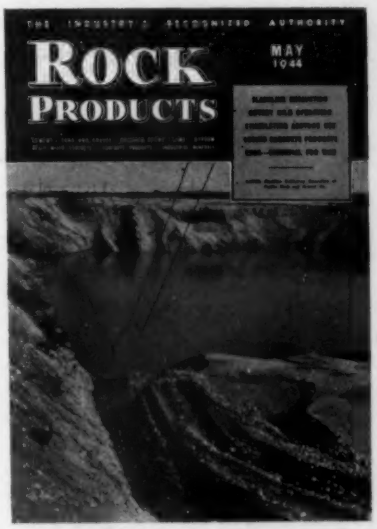
National Chemical Exposition, American Chemical Society, Chicago Coliseum, Chicago, Ill., November 15-19, 1944.

National Industrial Sand Association, Annual Meeting, The Homestead, Hot Springs, Va., June 8-9, 1944.

National Lime Association, Open Meeting, Board of Directors, The Homestead, Hot Springs, Va., May 16-18, 1944.

Our New Front Cover

WITH the May issue ROCK PRODUCTS will hereafter be dressed up in a new cover which will depict some interesting or unusual plant operation. Advertisers who have had the



Rock Products new cover design

front cover for their message for many years have very graciously relinquished this space for editorial display and will take space within the magazine.

This move is in step with the trend among publications, and it will greatly enhance the attractiveness of the magazine. We feel confident that our readers will approve this change, and we welcome any comments or suggestions that may be made concerning this new cover design.

Deny Gravel Extension

JANESVILLE SAND AND GRAVEL CO., Janesville, Wis., has been denied the right to extend its sand and gravel mining activities to newly purchased property inside the north limits of Janesville. The company may present a revised petition to the city plan commission affecting only a part of the new property.

Open New Pit

SOUTHERN OHIO QUARRIES CO., Columbus, Ohio, has purchased 30 acres of land near Chillicothe, Ohio. According to George Driscoll, sales manager, the company will open gravel deposits this Spring to supply ballast to railroads. A narrow gage railroad will be installed across Renick avenue to connect the new area with the company's holdings and plant on the west side of the street. The new purchase brings the company's total gravel land holdings in this area to about 80 acres.

HINTS *and* HELPS

Practical Ideas Developed by Operating Men

Door Protector for Trucks

AT A LARGE SOUTHERN concrete products plant trucks can drive into the main plant if necessary. To protect

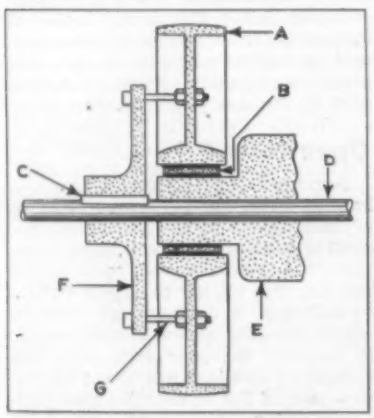
Section of old hot water tank filled with concrete and placed in floor protects doorway

the doorway from trucks hitting the sides, ordinary household hot water tanks have been set in the concrete floor and filled with concrete as well. This makes a neat and cheap, but effective protection.

Eliminate Shaft Deflection

By W. F. SCHAPHORST

This sketch shows how to eliminate belt pull from a shaft bearing so there will be no shaft deflection. Less space is required, and instead of two additional bearings as are sometimes used, there is only one—a roller bearing which consumes less power than ordinary plain bearings.



Sketch showing how motor bearing is applied to prevent shaft deflection from belt pull

Turn down the housing "E" of the motor if possible, or, cast such a housing and attach it to the motor and then mount the pulley on this housing, equipping it with roller bearings "B," between the pulley and hub. All belt pull then falls directly on the shaft housing. The flexible coupling "F" is keyed onto the shaft "D" and is connected to the pulley "A" by means of bolts "G," or by other means familiar to all who use flexible couplings.

With this method the force on the shaft is purely a twisting or torsional action, an ideal condition. There can be no binding,. consequently friction is reduced to the minimum. There is no longer that undesirable overhang, and, in addition, space is conserved.

Ball bearings may be used if desired, or, if roller or ball bearings are considered too expensive, simply use a plain bearing instead of the antifriction type. The first cost of this arrangement may be greater, but in many instances first cost is of much less importance than space and power saving and the elimination of belt drive troubles.

Recovering Gold

MANY Western sand and gravel plants and a few in the South have found that it pays to install gold recovery systems. One Southern sand and gravel operator recovered sufficient gold to pay all plant operating expenses. Although commercial gold mining has largely ceased operations, there is no reason why gold should be wasted in essential sand and gravel production.

In the accompanying illustration is shown the gold recovery equipment at the plant which furnished aggregates for the big California Shasta Dam project.

Vacuum Receiver Installation

By WALTER B. LENHART

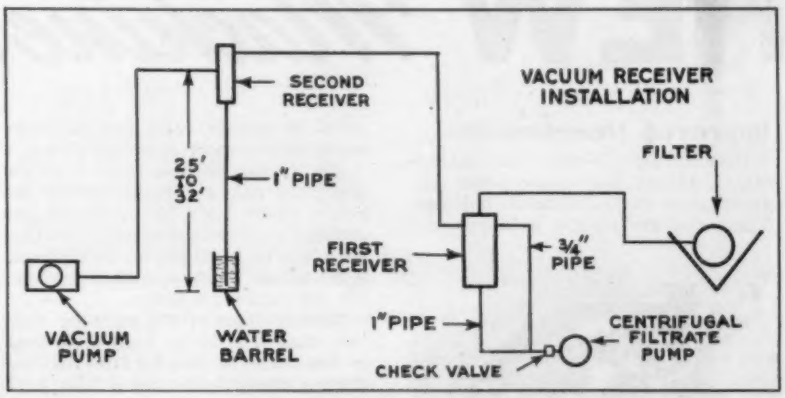
ON A CONTINUOUS VACUUM FILTER, the filtrate is usually removed from the receiver by a centrifugal pump through a system of check valves as shown in the drawing. However, it is always good practice, and it is recommended to have a second receiver mounted at such height that it would be impossible for filtrate to get into the vacuum pump, should the centrifugal filtrate pump fail for any reason. The second receiver should be mounted between 25 and 32-ft. high; theoretically it would be impossible to lift water by suction in excess of these figures, but there is always some "air lift" action that bubbles liquid into the higher receiver. The second receiver has a hydrostatic leg that ends with an open

Gold recovery system in the Shasta Dam aggregates plant

pipe in a barrel of water. Then in action, as the vacuum is applied, the water rises in this leg until it reaches its maximum height, some place below the receiver. Then as any liquid gets into the second receiver, it runs down this pipe (hydrostatic leg) and an equivalent amount of water passes into the barrel. It is well to have some overflow or drainage for the barrel as otherwise the spillage will mess up things.

In the illustration, the operator here used as his second receiver, an ordinary hot water tank for household usage was employed. In this case the hydrostatic leg ends in a barrel on the ground and involves several elbows in the line, which are okey, provided the line has some slope down hill all the way. Otherwise it might plug from sediment—all filters leak once in a while.

Second vacuum receiver on roof prevents filtrate from getting into pump



Piping diagram for vacuum receiver installation

Lime Treatment of Waste

THE JERRY DONOHUE ENGINEERING Co. some time ago was assigned the job of developing a process for treating the wastes from a small arms ammunitions plant. The objectionable materials in these wastes were soap solutions, cleansers, lubricants, and acid bath and rinse water that contained fairly large volumes of copper and zinc. The waste was highly turbid, had an initial appearance of laundry waste, and ranged from 1.7 to 9.5 in pH value.

Following a series of laboratory tests, made on the assumption that chemical treatment would be satisfactory, it was found that applications of from 2000 to 3000 lbs. of lime per million gallons of waste successfully removed grease, copper, and zinc, and neutralized the excess acid. While chemical precipitation by lime alone was not quite so effective as a combination of precipitants and coagulants, the results warranted its use in the full scale plant which was constructed. The results produced in actual operation did not equal those obtained in the laboratory, but did exceed expectations.

Tractor Spots Cars

IN THE ACCOMPANYING ILLUSTRATION is shown how a tractor is used to spot railroad freight cars loaded with sand and gravel. A section of steel rail was bent to form a bumper which was welded to angle iron braces at each end and then bolted to the arms ordinarily used to raise and lower the bulldozer blade on the tractor. This permits the steel rail bumper to be raised to engage the corner of a freight car at any desired point for safe movement of the cars into position.

The Red Top Trucking Co., Hammond, Ind., recently used this arrangement for spotting cars at a highway reconstruction job near Chesterton, Ind. The tractor is a Caterpillar Diesel D4, working 8 to 10 hours a day, on ¾-gal. fuel per hour. About 1700 tons of aggregates were unloaded per day.

Tractor with welded steel rail bumper used to spot loaded and empty sand and gravel cars

EASY DOLLARS

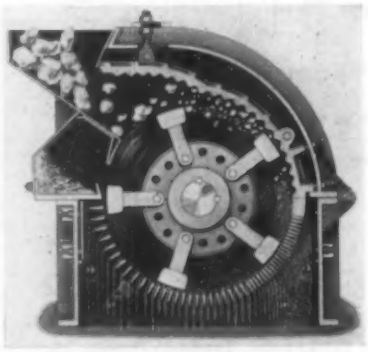
● Now that the pressure has let up on production in the rock products industries, operating men have an excellent opportunity to dig up some of those ideas that have been kicking around for reducing maintenance, increasing efficiency of machinery, and equipment, and improving plant safety. The HINTS AND HELPS section of ROCK PRODUCTS is Your page to reduce these ideas to print. Just jot down the facts, and send us a pencil or ink sketch or possibly a snapshot and the editorial department will do the rest.

A minimum of $5.00 is paid for every Hint and Help item sent in for publication; it may easily bring you $10 or more, depending upon the item's length and illustrations. Why not get some of these easy dollars by sending in your ideas and also benefit the industry by passing on the information to others?

NEW Machinery

Improved Hammermill

DIAMOND IRON WORKS, INC., Minneapolis, Minn., has made some improvements in its hammermill design. These changes involve a longer corrugated anvil to give more crushing surface before the stone reaches the grates. It also has a self-cleaning feature which provides that in the event of power failure and continuation of feed clogging up the crusher, an adjustment on the outside permits lowering of the grates through cam action and the machine will clean itself in a few minutes. The grates can then be raised again to proper position and operation resumed. The hammermill also has adjustable hammer arms and interchangeable hammers. A trap catches nuts, bolts, screws or other tramp metal or uncrushable material.



Hammermill is self-cleaning

Vibrating Type Block Machine

APPLEY-OWENS CORPORATION, St. Petersburgh, Florida, has had its Little Giant block machine in successful operation in several concrete products plants. One of the features of the machine is the action of the box. The box itself vibrates and the cores are stationary, which action, it is claimed, produces a superior block with square corners and a smooth face. It has a capacity of 100 to 120 of the standard 8- x 8- x 16-in. block per hour.

Operation is comparatively simple. The cement mix flows from the mixer to a feed-hopper down a trough to the mold box. The operator assists in distributing the mix uniformly in the mold box by using a wooden hand spreader. He then presses the electric foot pedal starting up vibrating action on the mold box at the rate of 6000 mechanical vibrations per minute. Vibration is applied for a maximum of 10 seconds when the foot pedal is released and the magnetic brake immediately stops the motor.

The hopper is then pushed to the rear. The next step is to elevate the newly made block by operating the counter-weighted lever and removing the block by hand to the drying rack. A maximum of 30 seconds is required for the entire operation.

Specifications of the machine indicate that it is 36 in. high from base to top plate; it weighs 1100 lbs., including motor; occupies a floor area 30- x 36-in.; and it is operated with a ¾-hp. electric motor having a magnetic brake for quick stopping. Cores are available for making 8- x 8- x 16-in. and 4- x 8- x 16-in. blocks and with partition plates for making two 4- x 8- x 16-in. and two 8- x 8- x 16-in. blocks.

Vibrating block machine has a capacity of 120 8- x 8- x 16-in. block per hour

Welding Electrodes

THE ANTHONY CARLIN CO., Cleveland, Ohio, has added four electrodes to its line. Grade P-61 is a shielded arc, general purpose, straight polarity d.c. electrode for welding mild steel in all positions. It is designed especially for fast production where high currents are used, and it meets the requirements of A.W.S. Classification E6012.

P-103 is a shielded arc a.c. electrode suitable for all position welding. It meets the requirements of A.W.S. Classification E6011 and A.S.M.E. Par. U-68. It is also said to be suitable for welding the low-alloy, high-strength steels when these steels are used primarily for their high strength properties. P-170 and P-180 are bare and wash coated electrodes meeting the requirements of A.W.S. Classifications E4510 and E4511, respectively. These are straight polarity d.c. electrodes which have a broad field of application where the physical properties indicated in the specifications are acceptable.

Gasoline Hammer Drill

THE SYNTRON CO., Homer City, Penn., has brought out a completely self-contained, gasoline hammer paving breaker type of demolition tool. With a solid star drill, and using water to flush the cuttings out of the hole, the hammer will drill rock to a depth of 30 in. The major advantage claimed for this tool is that it is completely self-contained, and does not require an air compressor, air hose and fittings, ignition battery, ignition coil and heavy cable, or any other source of power or accessory.

In principle, it consists of a 2-cycle gasoline engine in an inverted position with two pistons, one an engine piston and one a hammer piston. The engine piston is connected to the crankshaft at the top of the hammer and drives the flywheel ignition magneto, and a fan for forced air cooling. Starting is by a rope pull, the same as any outboard engine. The free hammer piston acts as a movable cylinder head for the engine piston, and as the explosion occurs, is driven downward to strike directly on the shank of the tool being used, and then returned to the "up" or firing position, not by springs,

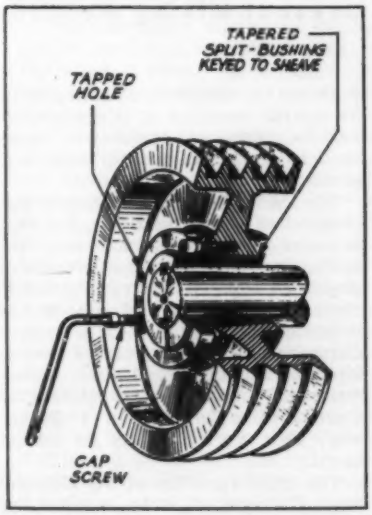
Self-contained, gasoline hammer paving breaker which may be used as a drill

but by low pressure exhaust gases. Consumption of fuel, gasoline mixed with oil, is said to be relatively low, the hammer being equipped with a fuel tank having a capacity sufficient for several hours operation.

Easily Mounted Sheave

ALLIS-CHALMERS MANUFACTURING Co., Milwaukee, Wis., has developed a so-called Texrope Magic-Grip sheave which embodies in its design several outstanding advantages. The accompanying sketch shows how it may be quickly installed or removed from the shaft.

The individual bushing assembly, consisting of tapered split sleeve, collar and snap ring, slides almost all the way into tapered bore of sheave without forcing. A slight clearance is left between bushing collar and sheave hub. Tightening of hollow-head capscrews draws bushing deeper into



Cut-away sketch of easily mounted sheave to show it is held to shaft and removed

tapered bore, compressing the split sleeve and locking entire sheave uniformly to shaft. Torque is transmitted through keys.

Truck Crane

HARNISCHFEGER CORPORATION, Milwaukee, Wis., has introduced a heavy truck crane of unusual design. Its main feature is a carrier built for crane work, not for crane transportation alone. A lower center of gravity gives greater stability in terms of hoisting capacity and boom reach, without the use of outriggers. With outriggers, working range is proportionately increased and, being built closer to the ground, outriggers require little blocking. Sway at the boom point is said to be markedly lessened by a frame of all-welded box section construction with a built-in torsional bar.

Truck crane which can be equipped as clamshell or dragline

The crane machinery is a standard P & H Model 255-A crane upper, complete with low-pressure, direct-acting hydraulic control and planetary boom hoist, which prevents the boom from falling suddenly. Operation is entirely independent of carrier power, with either gasoline or Diesel motor.

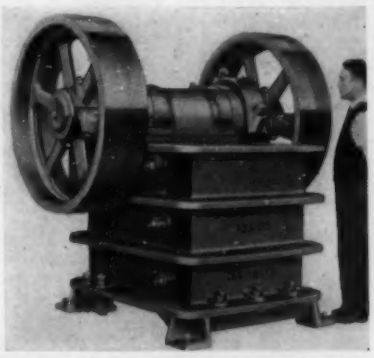
The entire unit is within standard road clearances, and its comparatively short wheelbase allows greater maneuverability on the highway, as well as on the job. Tractive power is by double drive axles in tandem. It has a low range transmission with 10 speeds forward and two reverse, and eight large rear tires provide low ground pressure. Steering is made easy by double cam and roller bearings with 21 to 1 ratio.

This unit is adaptable for all types of materials handling work, and it can be equipped with hook, clamshell, magnet, and dragline.

Roller-Bearing Crusher

SMITH ENGINEERING WORKS, Milwaukee, Wis., has announced an entirely new line of Telsmith roller-bearing jaw crushers. The illustration shows an 18- x 32-in. size. This crusher, as well as another machine larger than the present 25- x 36-in., will complete a line of nine sizes with capacities ranging from 5 to 300 tons per hour.

It was decided to retain the regular standard cast steel frame and swing-

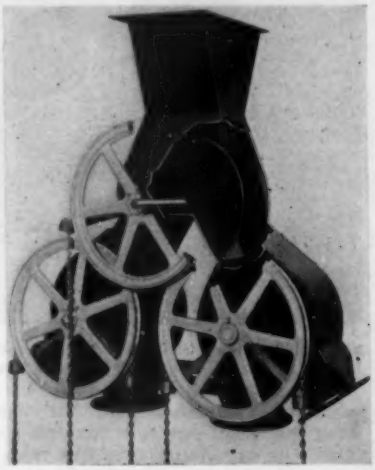


Jaw crusher with cast steel frame and swinging jaw construction

ing jaw construction in the new line of crushers. With heavy steel castings, it is claimed that there is no chance for weaving or cracking with resulting misalignment of bearings and other parts.

Multiple Outlet Flop Gate

THE C. O. BARTLETT & SNOW CO., Cleveland, Ohio, has introduced a modification of the inverted "Y" multiple outlet flop gate that is said



Fine materials cannot leak down wrong leg of multiple-outlet flop gate

to prevent any leakage down the wrong leg even when handling dusty or powdery materials.

Using this recent development, material is directed down one leg of the gate, or the other, with a pivoting chute having semi-circular sides, instead of the pivoting plate used in conventional construction. Material passing through the gate is wholly contained within the chute, and has no opportunity to pass down and out the wrong leg through the clearances that must of necessity be maintained in pivoting plate construction.

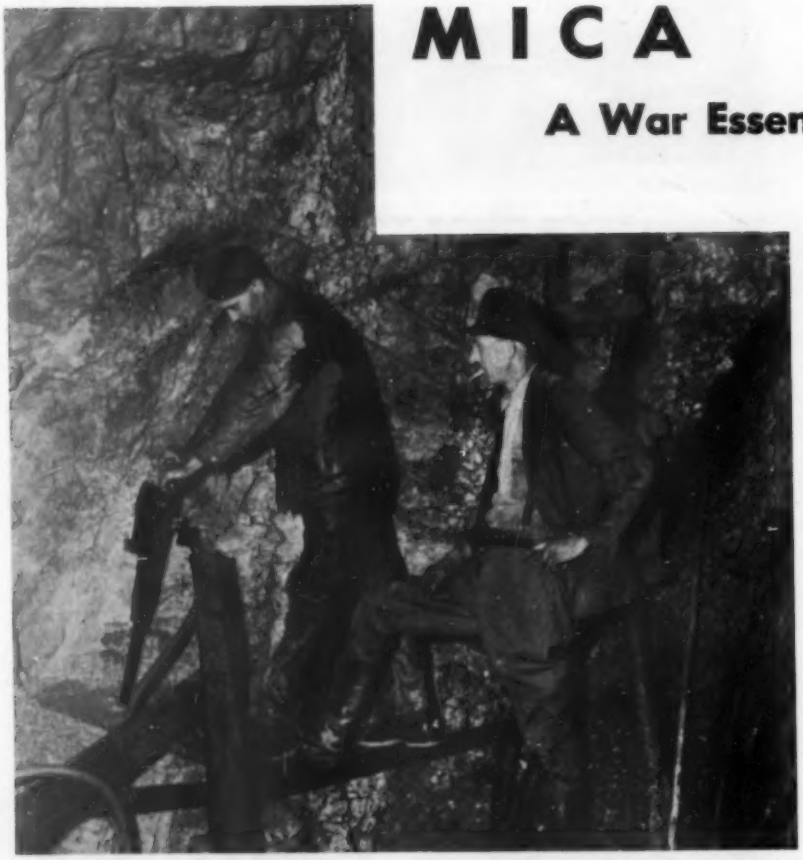
The chutes are operated easily with a chain and chain wheel, without any sticking or binding, and are held in position by gravity until changed. The gates have self-damming spouts and are available with 2, 3, 4 or more outlets, and in any capacity desired.

MICA

A War Essential Mineral

By E. J. LINTNER

First of two articles by well-known mica authority outlines federal program to stimulate production and describes prospecting and present mining methods



New machinery opens old mines in North Carolina. Men are working 80 ft. below the surface with equipment provided through the Colonial Mica Corporation, a federal agency

TODAY mica stands near the top of the list of strategic minerals so vital is its war needs. Strategic mica has been defined by the War Production Board Conservation Order M-101 as follows:

"Muscovite block and film mica of heavy stained quality or better, but excluding (a) block mica smaller than grade No. 6 (or grade 1 x 1 inch); (b) scrap mica; (c) muscovite splittings used in making built-up mica.

"Phlogopite (amber) block mica, including amber bookform splittings in grades (sizes) larger than No. 5, but excluding (a) block mica smaller than grade No. 6 (or grade 1 x 1 inch); (b) scrap mica; (c) other forms of amber splittings used in making built-up mica.

"The remaining portion or remnant of muscovite block or film mica, or phlogopite block mica resulting from fabrication if such remnant contains a usable area equivalent to grade No. 6 or larger."

Strategic qualities include only the better grade of mica, free from mineral inclusions. In addition, the mica must be hard, clear, reasonably flat, free of pin holes, cracks, cross-grains, reeves, ribs and other defects that would reduce its dielectric strength, or its property of being easily split into laminations or sheets of uniform thickness.

The better grades of domestic mica properly processed will equal in performance both in the laboratory and in actual use the best India mica. Color alone is no standard of value. While it is recognized that clear ruby mica will have a low power factor loss, nevertheless that of clear green or dark colored mica will vary from deposit to deposit.

Federal Program

To increase the domestic output of strategic mica various agencies of our government have been called upon. The United States Geological Survey has its geologists working in the known mica areas making geological studies of old and new mines and deposits. The Bureau of Mines also has its engineers making preliminary examinations of mines, while in several localities it is engaged in various types of exploratory work such as trenching, core drilling, and geophysical work.

The War Production Board has established a rigid mica program that includes control over not only the production but also the allotment of processed mica to the various fabricators. The program of this agency is being financed by Metals Reserve Company, a subsidiary of the Reconstruction Finance Corporation. Metals Reserve Company has appointed the Colonial Mica Corporation, 141 Broadway, New York City as its official agent.

The chief function of the Colonial Mica Corporation is to increase the output of domestic strategic mica by offering assistance to the miner. This assistance consists of technical and engineering service, granting of loans, leasing suitable mining equipment at a moderate rental based on cost of equipment, and instruction to miners and shop personnel in the proper trimming, grading and sorting of mica. This service is confined to only those mines or deposits that produce at least 50 per cent by value of the total mica output in the form of punch and sheet.

Offices have been established in the following cities adjacent to the known mica areas: Newport, N. H.; Asheville, N. C.; Custer, S. D.; Moscow, Idaho; and Los Angeles, Calif. Within the larger of these areas, field offices have been established out of which operate the mining engineers, instructors, and buyers.

The purchase of all domestic strategic mica has been placed in the hands of the Colonial Mica Corporation exclusively. In this manner a

closer control can be kept over this critical grade of mica. It is then allocated by the War Production Board to authorized fabricators only, to be made into articles for our military equipment and most essential civilian uses. The fabricator first must be granted an Allocation Order by the W.P.B. to permit him to process this mica.

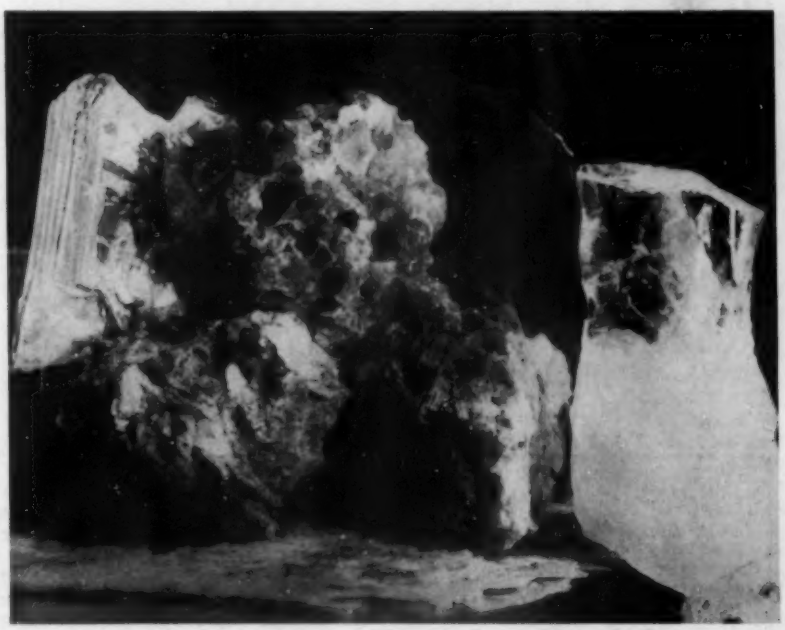
W.P.B. Order M-101 further states that:

"'To fabricate' means to cut, stamp, punch or split to predetermined shape or dimensions, or to change in any manner the form, shape or size of strategic mica, unless such fabricating is for the purpose of making emergency repairs or emergency replacements to prevent a threatened breakdown.

"'Product containing strategic mica' means a product into which fabricated strategic mica is assembled or inserted, such as a spark plug, condenser, or radio tube.

"'End-product' means a finished article, such as an airplane motor or radio set of which the product containing strategic mica is a component part."

No person or company shall fabricate or cause another to fabricate any strategic mica except to the extent specifically authorized by the W.P.B. Neither shall he fabricate strategic mica of a grade or size larger than is required to yield the particular pattern desired unless authorized by W.P.B. No manufacturer of a product or end product containing strategic mica shall fabricate or cause another to fabricate strategic mica of a quality better than is necessary for the particular product unless authorized by W. P. B. Neither shall he use strategic mica where a substitution of non-strategic mica or other material is practicable unless specifically authorized.



Samples of crude mica as it comes from the mine before processing

War Conservation Order M-63 as amended restricts the importation of strategic materials including all kinds of mica except splittings, scrap and ground mica. Mica may be imported only after authorization by the Director of Industry Operations. Applications for imports of mica from all countries except India and Brazil are being favorably considered. In these two countries an agency of our government is now the sole buyer of mica.

The military demands for the smaller sizes of mica have greatly increased. In order to stimulate the production of these sizes a new buying schedule was recently compiled by Colonial Mica Corporation under which a substantially higher price was paid. This new schedule offers a fixed price of $5.00 per pound for all sizes of sheet mica from 1½ to 2 inches and up, three-quarter trim or better. This applies to either No. 1 or No. 2 quality. The Colonial Mica Corporation has guaranteed that present prices will remain in effect at least until June 3, 1944.

Two alternatives are offered under which Punch may be purchased:

(1) As Punch Mica at a Base Price of 40c per pound.

(2) The small sizes from 1 x 1 in. up to 1½ x 2 in. can be trimmed out of the punch, prepared Full Trim and sold at $5.00 per pound for either No. 1 or No. 2 quality.

If the small sizes are trimmed out of punch, the remaining washer mica, not being needed in the war program, will not be purchased by Colonial Mica Corporation and can therefore be disposed of on the open market.

Face in one of the largest mines in North Carolina. Note position and direction of drill hole with relation to mica "books"

Price Schedules

Records of the corporation show that two-thirds of their purchases of sheet mica have been Three-Quarter Trim. Studies made of rifting costs show Three-Quarter Trim affords the greater return to the producer. Since this trim is acceptable to the fabricator, the Half-Trim has been eliminated under the new Schdeule II.

The new price schedules are as follows:

Load of mica being transported to rifting plant

SCHEDULE I

Table A		Table B	
Punch:		Punch:	
No. 1 Quality		Not Purchased	
Base Price $0.30		Under this Table	
Sheet:		Sheet:	
No. 1 Quality		No. 1 Quality	
Half Trim		Half Trim	
Grade (Size)	Base Price Per Lb.	Grade (Size)	Base Pr. Per Lb.
*1 x 1 in.....	(*)	1 x 1 in.....	$1.00
*1¼ x 1¼ in.	(*)	1¼ x 1¼ in.	1.75
1½ x 2 in...	$2.40	1½ x 2 in...	2.40
2 x 2 in.....	3.52	2 x 2 in.....	3.52
2 x 3 in.....	4.64	2 x 3 in.....	4.64
3 x 3 in.....	5.12	3 x 3 in.....	5.12
3 x 4 in.....	6.08	3 x 4 in.....	6.08
3 x 5 in.....	7.04	3 x 5 in.....	7.04
4 x 6 in.....	8.00	4 x 6 in.....	8.00
6 x 8 in.....	9.12	6 x 8 in.....	9.12

*Not purchased under this table.

Discounts for Substandard Quality Punch or Sheet

Bonuses Paid for Three-Quarter Trim: Maximum 30%

Bonuses Paid for Full Trim: Maximum 40%

No Bonuses Paid for Quality

This schedule does not apply either to No. 3 Quality or to Black Stained Mica.

The prices set out in Schedule I, Tables A and B, are the same as now in effect and as published under date of November 1, 1942.

SCHEDULE II

Table C

Punch Mica: Base Price $0.40 per lb. Subject to Discount for Substandard Quality

Sheet Mica: No. 1 and No. 2 Quality

Sizes under 1½ x 2 in. Not Purchased Under This Table

Sizes 1½ x 2 in. and Over, Minimum Three-Quarter Trim: Price $5.00 per lb.

No Half Trimmed Mica Will Be Purchased Under This Table

Table D

Punch Mica: Not Purchased Under This Table

Sheet Mica: No. 1 and No. 2 Quality

All Sizes from 1 x 1 in. to 1½ x 2 in., Fully Trimmed: Price $5.00 per lb.

All Sizes 1½ x 2 in. and Larger, Minimum Three-Quarter Trim: Price $5.00 per lb.

No Half Trimmed Mica Will Be Purchased Under This Table

This schedule does not apply either to No. 3 Quality or to Black Stained Mica.

Conditions

Seller has the option to sell under any one of the four price tables but cannot divide a lot and sell it under two Schedules or two Tables.

Should Table No. A or Table No. B under Schedule No. 1 be selected for the sale of any lot, subsequent sales may be made under Table No. C or Table No. D, Schedule No. II.

Should Table No. C or Table No. D under Schedule No. II be selected for the sale of any lot, subsequent sales by the same seller from the same mine cannot be made under Table No. A or Table No. B, Schedule No. I.

All prices quoted in Schedules No. I and No. II are f.o.b. the shipping point nearest the producer's rifting shop.

No. 1 Quality Mica must be clear and free of all mineral and vegetable inclusions, stains, air inclusions, waves, or buckles.

No. 2 Quality Mica must be clear and can contain waves, and light clay or vegetable stains.

What Is Mica?

The term "mica" is derived from the Latin "mico" meaning to shine or glisten. It is a group name for a number of aluminum silicate minerals that vary greatly in chemical composition. These minerals possess a basal cleavage so perfectly developed that it permits their being split into exceeding thin laminae or sheets. Mineralogists recognize eight distinct varieties of mica and these are commonly classified according to their dominant component. Of these eight, only two, muscovite and phlogopite, yield so-called strategic mica.

Muscovite or potash mica is the most important of the group and is the only variety mined extensively in the United States. It usually occurs as tabular crystals, hexagonal or rhombic in outline whose prismatic faces are more or less rough and striated horizontally. Crystals may range in size from 1/16 in. or less up to 10 ft. or more in diameter. Muscovite has a hardness between 2 and 2.5 on Mohs scale, while the specific gravity varies between 2.7 and 3.0.

Thin sheets or laminae are transparent, elastic, flexible, and usually colorless. Thicker masses, however, usually show a distinct color or shade of brown, gray, green, red, or yellow. The color, due probably to minute inclusions of metallic oxides, permits the common classification of mica as, "amber," "ruby," "rum," "green," "smoked." Colonial Mica Corporation places all these into only two color groups, namely, ruby and green.

The physical and chemical properties of muscovite vary greatly from different localities. Practically all the industrial uses, however, are dependent upon its physical properties alone.

Muscovite is also the most common of the micas being an essential constituent of all granites, gneisses, schists, and related rocks. Its commercial significance, however, in these forms is very little.

Strategic muscovite is invariably found in deposits of pegmatitic origin. Pegmatites are described as rocks containing coarse and unevenly crystallized and segregated minerals occurring as dikes, veins, or metamorphic masses that were formed from aqueous solutions of a freezing magma, or from the combination of the solutions with previously existing minerals. Many other accessory minerals are also present in pegmatites and Colonial Mica Corporation is interested in beryl, columbite, and tantalite.

The exceedingly coarse crystallization encountered in pegmatites is of great importance in that it contributes large crystals and books of mica from which sheets of unusual size can be trimmed. A single crystal of mica weighing 4232 lbs. was found in North Carolina in 1926, while the largest found to date in the world was in India. This crystal was discovered in the Nellore field and measured 10 ft. across the basal plane and 15 ft. across the folia. A new field just recently opened in the Eau Claire district in Ontario, Canada, has created wide interest. Crystals varying from 12 to 24 in. are quite common while the largest found to date measured 6 ft. across the face.

Pegmatites vary greatly in shape and size. They may exist as dikes and veins ranging up to a mile or more in length and several hundred feet in width, or they may appear as pipes, chimneys, lenses and sheets varying in width from a few inches to several hundred feet. Three types of deposits are recognized, (1) vein or fissure, (2) pocket, and (3) contact deposits. The majority, however, fall within the first and second types.

While it is true that strategic muscovite is found only in pegmatites, nevertheless the existence of

(Continued on page 92)

Laboratory Grinding Experiments

Effect of the size of grinding medium upon the properties of the resulting cement

By DR. F. O. ANDEREGG*

TO DETERMINE the effect of the size of the grinding medium upon the properties of the resulting cement, three lots of clinker were ground using balls ⅞ and ⅜ in. in diameter. The mill had a diameter of 10 in. and a length of 12 in. It rotated at 40 r.p.m. and was charged with 100 lb. of balls and 10 lb. of clinker which had passed a 10-mesh screen. The clinker had the following composition:

SiO_2	Fe_2O_3	Al_2O_3	CaO	MgO	SO_3	In. Res.
21.20	3.28	6.06	63.0	2.24	1.69	0.12

The glass composition was estimated at about 5 percent. The size distribution was determined in a butanol elutriator. It was soon observed that the smaller balls had difficulty in handling the very large grains, which often had a diameter of nearly ¼ in., so it seemed logical to compare the effect of grinding with ⅞ in. balls only, with that of first grinding with the large balls followed by the smaller balls.

On plotting the size distribution it was found that all samples were characterized by two apparent humps, the one at 10 microns and the other at from 25 to 30 microns. These humps were probably worse with the laboratory mill than would have been the case in a large tube mill with its greater number of impacts.

Better Results with Smaller Grinding Media

Workability and water retention were appreciably better after grinding with the smaller balls. An interesting experiment was set up to determine the resistance to drying of the cement ground 15 min. with the large balls as compared with that of the same clinker ground 5 min. with the large balls and 10 min. with the small balls. Mortar was mixed up 1:3 with local river sand gaged to a flow of 105 percent with these two cements. The mortars were stored in a large bucket where some loss of water could occur by evaporation. Every 15 min. a flow was run. At the end of an hour the mortar made with cement ground with large balls only had a flow of but 45 percent, while the other cement partly ground with small balls had a flow of 70 percent which was maintained for another half hour. This observation seemed to indicate a better packing, with smaller capillaries between the grains, to hinder water evaporation. The importance of this resistance to evaporation, especially in road work, is obvious.

Mortar Strength Tests

Mortar strengths with standard Ottawa sand at normal consistency were observed up to seven days. On examining the results it was noted first, that the strengths were appreciably higher when two sizes of balls were used (22 percent at 7 days), than with only the large balls. Second, the strengths did not correlate with the water requirement, since this depends upon the surface area exposed and upon the voids between the cement grains. A larger surface requires more water to hydrate the cement to reduce strength. Poor size distribution (humps in the grading curve) means, on the other hand, interference with proper packing and more voids to fill, with decrease in workability, poorer water retention, and decreased strength. So the water requirement gives only ambiguous information under these conditions. The two lowest water requirements accompanied the two lowest strengths, while the cements requiring the greatest amount of water ranked sixth, fifth, and first in strengths. The humps in the grading curve undoubtedly contributed to the results observed, but the accuracy of the results obtained with the butanol elutriator in combination with the small laboratory mill were not sufficient to permit much accurate analysis.

These experiments need to be repeated on a large scale with a full size tube mill working on very uniform feed. Some data were obtained with ⅜ in. balls in a large mill, but variations in amount and character of the clinker fed, made it impossible to get results sufficiently good to draw discriminating conclusions. However, it was very evident that finishing with the smaller balls produced a cement appreciably superior in working qualities and strength for a given amount of energy expended.

Some results obtained in grinding with air separation were found to be of interest in this connection. In one case, clinker from a Bradley-Hercules mill operated in closed circuit with a Hum-mer screen to produce a surface area of about 640 sq. cm./g., was ground in a 7- x 22-ft. tube mill loaded to 45 percent of its volume with ⅞-in. balls. After separation its area was about 1700 sq. cm./g. On plotting a size distribution curve, a considerable hump at about 25 microns was apparent. On regrinding a similar cement in the same type of mill and with similar media, a surface area of about 2700 sq. cm./g., was obtained and the cement had a small hump at 20 microns. Whereas a yield of 90 bbl. per hr. was obtained on straight grinding, with a surface increase of about 1000 sq. cm./g., the regrinding gave only a little more surface increase (about 1100), but the yield was only 47 bbl. per hr.

As is well known, the efficiency of grinding falls off greatly in making high early strength cements. It is suggested that decreasing the size of the balls, with a corresponding increase in surface and number of impacts, will tend not only to give great efficiency, but also will probably help to give a smoother grading curve.

*Consulting Specialist on Building Materials.

How to Get More Locks

HERE IS GOOD NEWS for quarries, mining companies and warehouses handling explosives and explosive ingredients!

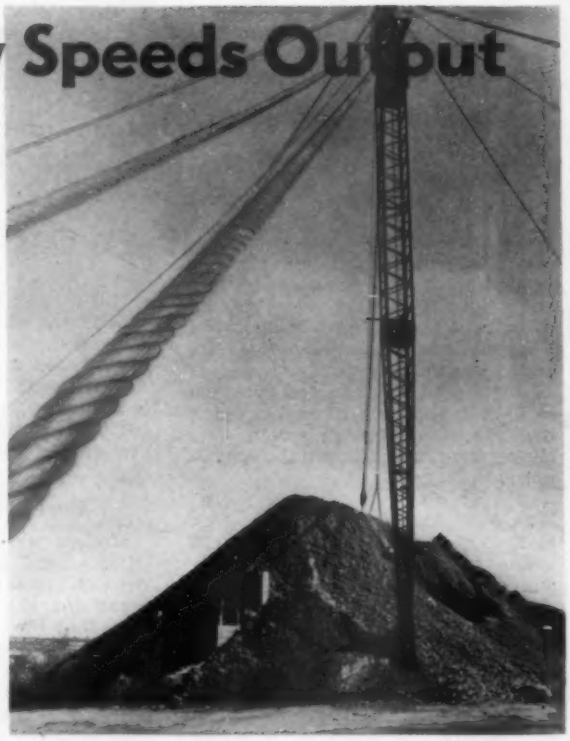
Any company in need of locks, to protect explosives, can obtain them by stating its requirements to visiting U. S. Bureau of Mines inspectors; or by addressing a letter to the nearest U. S. Bureau of Mines office, or to Explosives Control Division of the central office of the Bureau, Washington 25, D. C.

Upon receipt of the request, the U. S. Bureau of Mines will mail the applicant a certificate authorizing the purchase of the locks. The applicant will then attach this certificate to his purchase order and mail both to the supplier. The supplier's name and complete mailing instructions will appear on the certificate. When the supplier receives the purchase order, with the certificate, he will forward the locks by return mail.

Slackline Cableway Speeds Output

Pacific Rock and Gravel Co., excavates material below water and transports it to plant stockpile with slackline cableway system

By JIM MEDFORD



Mast for slackline cableway system

RAW MATERIAL production is unique at the Monrovia plant of the Pacific Rock and Gravel Company in the San Gabriel Wash district, Los Angeles county, Southern California. Gravel deposits in this area extend to 400-ft. depths. Due to subterranean water conditions encountered at various levels, though seldom above 125 ft. depending on the slope and distance from foothills, Pacific Rock found it necessary to abandon shovel and truck operations from pit-to-field hopper at a depth of only 60 ft. for excavation with a slackline cableway system.

One of several Los Angeles companies with plants located in the semi-arid wasteland west of the San Gabriel Mountains, and the only one with any extensive water difficulties, Pacific Rock has overcome the unusually shallow-depth water conditions by means of a 1000-ft. high cableway of 1½-in. wire rope strung from a 120-ft. fabricated steel mast to anchors set well back from opposite pit brow.

Cableway System

The steel mast is supported by six steel guy lines, three single strands of 1⅜-in. steel wire on the front or pit side and three double strands of 1¾-in. steel wire on the rear or plant side. Doubling of heavier wire was necessary on the after side because of the heavy duty nature of digging and hauling to surge pile at base of mast where conveyor leads to plant crushers, screen sizing, and distribution system. This structural type of head tower is located near the exit end of the loading tunnel feeding from live storage to the first section of Link-Belt rubber belt conveyors.

Storage bins showing driveway through and under screening plant. Sand discharge from classifier may be seen above, to the left

As is usual in pits of this kind, the face is sheer and for efficient operation it was necessary to install permanent anchors for the high line on the far side of pit from mast to replace the temporary "dead men" in pairs used with a 25-ft. tail tower on skids. These permanent anchors are a series of 40-cu. yd. concrete blocks spaced on 300-ft. centers and embedded in the coarse gravel of the high ground back of pit face. The high line from mast is moved from anchor to anchor as material is excavated, giving flexibility to digging operations. Moves from anchor to anchor of tail end of high line are much less often than the previous sets made in spotting shovel. Also it reduced use of conveyors and field hopper and the later use of trucks between shovel and hopper. This new set-up makes possible normal production of 300 tons an hour with peak production going to 400 tons per hour.

A Willamette multiple-drum hoist of the logging type, powered with a

300-hp. General Electric slip-ring motor bolted to a 60-cu. yd. concrete foundation, controls the high line. One drum operates the high line control cable that leads from the hoist direct to a sheave in the masthead and is part of the four-part double purchase bent to high line cable, shown in illustration.

The 1½-in. wire rope leads from the hoist drum to a block in base of the mast, thence up and out over topside sheave to chain-bail of 8-cu. yd. bucket fabricated by Pacific Rock. The present bucket is heavily reinforced through the installation of a heavier lip and digger teeth.

Due to the constant, fast operation of hoist drums, they become overheated. To overcome this, a blower is used for cooling. Brakes are operated by air supplied from a 4-hp. G.E. motor-driven compressor. Blower is driven by a 2-hp. G.E. motor.

The 5000-ton stockpile, which can be built up to a height of at least 60 ft., feeds through gates in a tunnel onto a 30-in. belt conveyor over Link-Belt feeders. This concrete tunnel is 12 ft. square and 60 ft. long. After leaving the tunnel, the belt conveyor extends 540 ft. to discharge onto a scalping screen with openings set for 14 in. and driven by a 40-hp. U. S. motor.

Scraper bucket of 8-cu. yd. capacity on its way to surge stockpile

Screening and Crushing Facilities

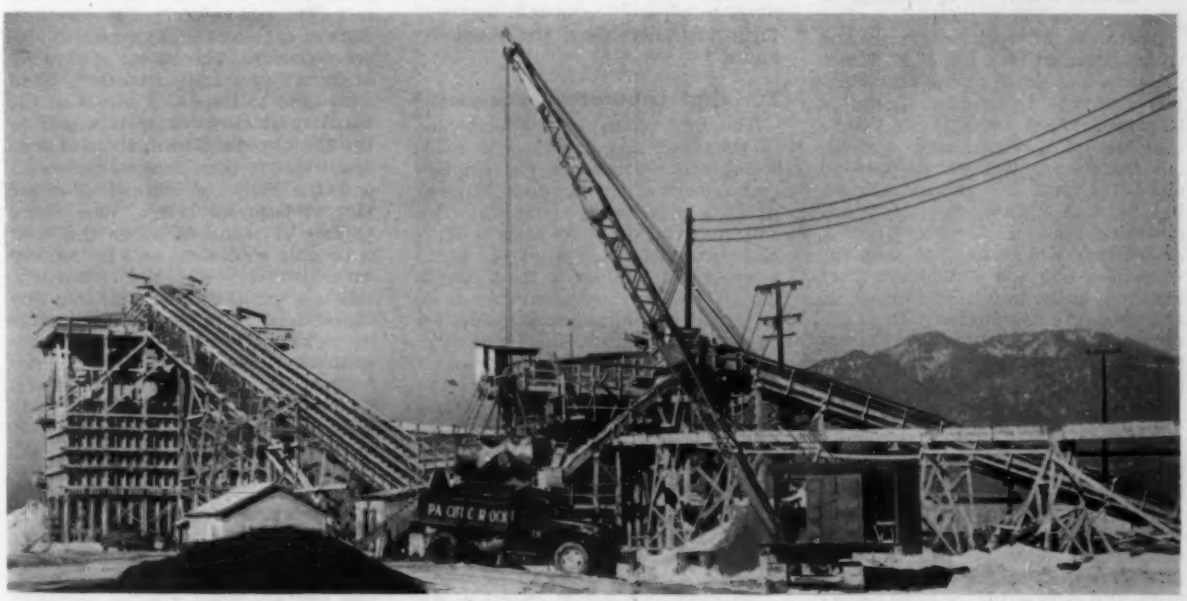
Throughs from this screen are fed to another 30-in. conveyor and thence to a 42-in. Link-Belt rotary screen with a 30-hp. G.E. motor. At this point the gravel and sand are separated from the coarse rock and discharge onto two 24-in. belt conveyors. The minus 5-in. material is fed through a 4-ft. Symons cone crusher with 125-hp. G.E. motor. The plus material passes to an Allis-Chalmers 6K crusher with a 75-hp. Fairbanks, Morse motor.

Discharge is to separate 42-in. Link-Belt trommel screens, one for the plus and the other for minus sizes. These trommel screens are powered with G.E. motors. The aggregate then passes to bins in the 30- x 70-ft. main storage section of the plant.

From the gravel trommel screen, the sand is discharged by chute to a Stephens-Adamson sand classifier, and stockpiled. This classifier is driven by a 20-hp. G.E. motor. Water for sand launder and plant supply is pumped from a company-owned well through an 8-in. line by a Layne-Bowler pump driven by a 50-hp. G.E. motor, delivering 600 g.p.m.

On the rock side, the trommel discharges to a triple-deck 4- x 6-ft. Allis-Chalmers vibrating screen for

(Continued on page 55)



Loading truck in plant yard with clamshell. Scalping screen may be seen in the center, and main screening plant and storage bins, to the left

Sand Recovery

Changing Sand Size Distribution

Part II—Preliminary Plant Preparations

By NATHAN C. ROCKWOOD

Every producer should have some laboratory equipment for testing materials

THIS IS a continuation of a projected series of articles begun in the July 1943 issue, the first of which was in the nature of an introduction. In that introductory article we emphasized the necessity of knowing what kind of material you had in your deposit and of making an examination of your waste material to see if you were losing fines that could be recovered, with a discussion of some of the general principles involved in fine sand recovery.

It is realized, of course, that recovery of very fine sand, if it exists in the deposit, is only one of the problems of producing a properly graded, specification sand. At the time the first article was written it appeared to be the most important problem then facing producers. Since then much has been learned about air-entraining portland cements, and it now appears that general use of such cements may result in a slackening in the demand for very fine material in sand. For the small air bubbles in the concrete mix serve one purpose of the —50 and —100-mesh fine sand in preventing "bleeding" and providing plasticity or workability to the mix. Air-entraining cements also require less mixing water, while addition of fines requires more water.

There are influential engineers and specification writers, like C. E. Wuerpel, principal assistant engineer, Central Concrete Laboratory, Corps of Engineers, U.S.A., who do not believe that use of air-entraining cements obviates the requirement for the —50 and —100-mesh fines in sand. Others, like Stanton Walker, director of engineering, National Sand and Gravel Association, are inclined to take the view that —50 and —100-mesh fines are more in the nature of admixtures and should be supplied as such at the concrete mixer rather than incorporated in the sand at the point of production.

Most Common Problem

Some of the newest and most written-about sand and gravel plants are those serving metropolitan markets, where there is demand for sand of different size gradations as for plaster sand, asphalt sand, etc. The tendency in the design of these plants has been to go into sand sizing, or sand classification, in a big way. When these plants are called upon to fill a specification for concrete sand with limiting percentages in certain size groups, it is comparatively easy to recombine the various sizes in the correct proportions to meet the specification.

However, before we go into this subject of sizing into three or more gradation groups and recombining, we will discuss the much more general problem of meeting a specification without going to all this trouble of separating and recombining. The great majority of commercial sand and gravel plants are called upon to make two sand products only: (1) concrete sand; (2) mortar or plaster sand. And whether necessary fines are recoverable or not, or whether they are in the deposit or not, the specifications for concrete sand are likely to require a sand that will conform to fairly close size-gradation limits.

Essential Laboratory Equipment

The day of haphazard operation in the sand and gravel business is about over. Therefore the primary requirement of any operator, large or small, is to know the character of his raw material, how to process it to best advantage, and what the character of his product is from day to day. This last requirement, since above all else it provides means for obtaining uniformity in his product, certainly will be demanded of him in in the years to come. Since few deposits of sand and gravel are uniform in character in all parts of pit, it is evident that intelligent operation in the pit remains a day-to-day check on the raw material being fed to the plant. This is the first and most important factor in producing a uniformly graded finished product of sand.

No sand and gravel operator can operate intelligently without some pretense of a "laboratory" as part of his operation. This does not mean anything elaborate or any "funny business" that only "highbrows" can understand. It means simply a graduated glass bottle or two, a small nest of laboratory sizing screens — the most important ones being a No. 4; a No. 8; a No. 14; a No. 28; a No. 48 and a No. 100; and a fairly accurate scale for weighing samples. An investment of probably less than $150 in these pieces of testing equipment will be justified in many ways—not only because they provide the means of controlling the quality of product, but because their presence and use in the plant office is one of the best sales arguments.

The graduated 32-oz. bottle (quart) is used for a simple sedimentation test. The test prescribed by the U. S. Bureau of Reclamation is probably as good as any. The 32-oz. graduated, druggist's prescription bottle is filled with sand to the 14-oz. mark on the bottle, and clear water is added to the 28-oz. mark. The mixture of sand and water is then shaken vigorously and the contents allowed to settle (for at least an hour). One ounce (1 oz.) of sediment above the sand is roughly equivalent to 3 percent by weight of clay and silt. Obviously, this is a "plant control" test that any superintendent or foreman can readily make, several times a day, if desirable or necessary. Made on the raw product from the pit, with the gravel screened out, it will give an estimate of the amount of "dirt" that must be dealt with in the washing operation; and made on the finished sand product it will be a good index of the thoroughness of the sand cleaning operation; or, if a considerable percentage of —100-mesh material is required to be retained in the sand, this test will show whether or not it is there.

If the specifications require 3 or 5 percent of 100-mesh in the finished product, the user of course will want to know what the nature of this material is. The live-wire plant operator can siphon some of it off from the graduated bottle, dry it, and look at it under a small microscope, or send it to a commercial physical and chemical laboratory to have its nature scientifically determined. If it is a silica "silt," it is desirable and readily acceptable by informed users; if it is something else, some question of its desirability may be raised, although it may not be possible to obtain any other kind of fines.

IRVING WARNER (vice-president, Warner Co., Philadelphia, Penn.) has said that in sizes below 100-mesh, the percentage of silica in sands he has tested decreases rapidly. C. E. Wuerpel, describing concrete operations in the lower Mississippi Valley, using river water for mixing, has said the concrete was better when the water was silty (or "muddy") than when the water was clear. On the other hand, as Mr. Warner has said, sand with 3 to 5 percent of —100-mesh and some 20 percent passing 50-mesh, will look "dirty" to the uninitiated user, and often not be accepted; so any operation set up to recover and put these fines back into the sand, must also be set up to take them out when a customer insists.

One fact should be borne in mind in determining the nature of the sediment in sand. As everyone probably knows, the drying out of clay changes its physical make-up. A plastic clay once dried never recovers its plasticity, it becomes gritty. Hence, if there is a considerable percentage of clay in your raw material, and you have a wet operation, you can get a much better idea of the character of the sediment from the bottle test than from the dried-sand screen test. In this latter test some of the agglomerated clay particles may get into the smaller sand sizes and look like sand. And in your plant washing and classifying operations a plastic clay suspension in water is something different from a dried clay suspension.

Probably a permanent "exhibit" of a graduated bottle partly filled with sand settled in water and another bottle with similar layers of different sized dry sand, from the screen test, would be helpful by providing a comparison of the two. Some operators may become so expert in thus judging samples that the simple bottle test, two or three times a day, would be enough, with a check screen test at longer intervals.

There are a lot of other tests the engineer user will probably make of your sand. He will want to know if there are any organic impurities (the color test in sodium hydroxide solution), specific gravity, absorption or soundness tests, etc. It isn't necessary, ordinarily anyway, for the plant superintendent to worry about these, once the source of supply and the material have been approved. The possible exception is some kind of a test for soundness; for specifications on this point are getting more stringent, and it may become necessary to include some kind of a plant control test for soundness, so that not more than a specified percentage of unsound particles are included in the finished product.

This test probably will not be difficult—simply let a bottle mixture of sand and some liquid of high specific gravity settle, as in the case of the sand and water mixture, already described. If some heavy liquid is used as the medium the lighter and less sound particles can be made to float or to come to the top as does silt, and thus their quantity and character can be determined. How to get rid of this light or unsound part of the sand or aggregate as a plant processing operation is something else. It's a problem yet to be solved. But at least the plant operator should himself have the information about his own aggregate, for his customer is going to find out anyway.

To Be Discussed

One of the chief difficulties in a sand sizing or separating operation is that separation and washing are almost invariably combined in one and the same operation. Obviously, the logical procedure would be to wash the dirt and other undesired material out of the raw material before starting to process it further. There are ways that this can be done, as we shall point out in subsequent articles. As very generally practiced, however, sand in various sizes is recovered from a stream of water heavily loaded with clay, loam, or just plain "dirt," which contains the washings of the entire raw material—both gravel and sand. Neither good washing nor accurate sizing, by hydraulic methods, can be accomplished with such a liquid, without the addition of much more clean water, as a diluent, than is frequently used.

(To be continued)

Slackline Cableway System

(Continued from page 53)

division of material sizes including rock dust.

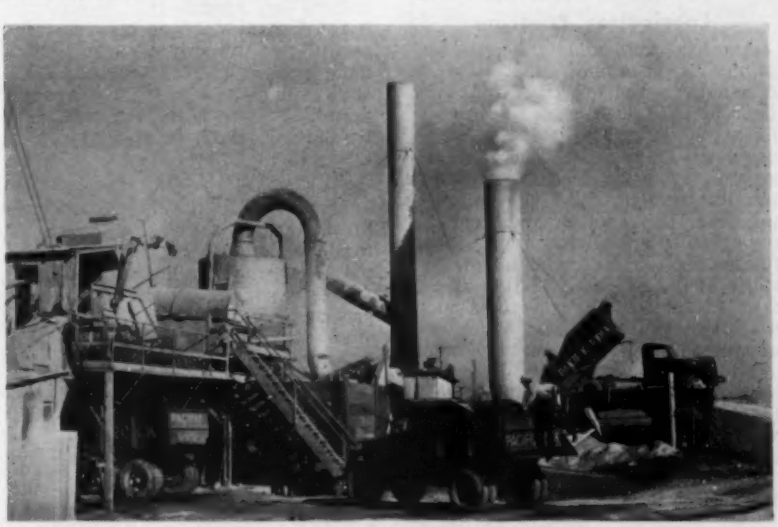
Material is loaded through plant bin chutes into trucks that pass through driveways below, using concrete paved runways. Plant has 12 storage bins measuring 15- x 20-ft. with a total capacity of 2000 tons.

The ready mixed concrete batching plant is of 150 tons capacity with cement storage alongside for convenience in rapid loading without shifting trucks more than a few feet. Deliveries are made with 4-cu. yd. mixer trucks.

Outgoing materials are weighed over one of the two 50,000-lb. Fairbanks, Morse truck scales. For materials loading from stockpiles, there are two Northwest clamshells, ½-cu. yd. and a 2¾-cu. yd. capacities. Both are track-mounted and gasoline-engine powered.

In addition to the rock plant there is a separate Madsen hot bituminous mix plant with a production capacity of 100 tons per hour, and having a total storage capacity of 100 tons of asphalt in three bins. The rotary dryer is 6- x 24-ft., which is fed material with 24-in. belt conveyor and bucket elevator. Automatic scales are Road Construction type.

Plants are in charge of William Alexander, superintendent.



Hot mix bituminous plant has been very active during the recent war construction period. Company also operates ready mixed concrete plant

Controlling Factors for Efficient Kiln Operation

Article 6—Lubrication and Maintenance

By RALPH GIBBS*

AFTER THE ROTARY KILN operation has been served its requirement of manpower, fuel, raw materials and refractory lining, it would continue a poorly functioning unit without satisfying the inherent demands of machinery for proper lubrication and adequate maintenance and repairs.

Probably no other piece of machinery in the world of mechanisms works under such adverse, strenuous and attenuating conditions as the rotary kiln and its accessory equipment. The manner in which some plants operate for month upon month, day and night, is the cause for profound wonder and respect.

There is also the problem of high temperatures. The kiln is hot. The cooler is hot. Everything about the discharge end of the kiln is hot. Even the handrails scorch the ungloved hand. Men sweat and mop their brows. It is hot. The very air you breathe seems to scorch the delicate membranes of the nasal passages, especially during the hot summer months—yet the wheels and gears must turn, and they must be oiled and greased, and even the oil and grease knows how hot it is and how hard their task is.

Lubrication Program

Another problem is the dust and grime. It is almost impossible to eliminate completely this nuisance. Lubricants of open gears become collectors of this gritty substance, being converted from good clean oil or grease to suspensions of veritable grinding compounds. Those who appreciate the exacting requirements for creating and maintaining proper lubricating conditions shudder because of the reckless violation of the laws of lubrication; yet they must marvel at the manner in which the abused points of friction hold up.

Thus we have serious lubricating problems involving continuity of service, elevated working temperatures, and contamination of the lubricants by grime and grit.

Probably the most favorable plan for securing the best service from those points requiring lubrication is to follow the recommendations of the machinery manufacturers, especially as to the type of lubricant. Their equipment is designed for a specific purpose to operate under conditions with which they certainly should be familiar. In the event the equipment manufacturer's recommendations are not available, the services of a reputable manufacturer of lubricants can be sought. This procedure will assure the proper type of lubricant being used.

Such a move as this, however, is only the beginning of the well planned lubrication program. The proper lubricant improperly applied can, and generally does, result in waste. Consequently a definite plan or schedule should be adopted to assure a successful lubrication program. This is generally arranged according to some suitable period of operating time. Thus one part might require greasing or oiling once every eight hours, whereas another part can operate twenty-four hours between lubrications.

In large operations the oiler or oilers will be specifically charged with these tasks. In smaller operations the helpers can assume this responsibility. In any event, the extreme importance of properly performing this duty cannot be overstressed. Slipshod attendance to this job cannot be permitted. It must be performed with regularity and thoroughness.

Safety

The oiling or greasing of moving or operating machinery is strictly forbidden in many plants because the men doing this job are in danger of being caught by the turning or moving parts. Violation of this common-sense safety regulation has cost Industry many hours, many injuries, many dollars and many lives. Yet the machinery must be lubricated and it should be operated as continually as possible. The solution of this problem is simplified by providing means of supplying the lubricant to the point of use from some position away from all hazardous moving parts of the machinery. Force-feed, drop or wick oilers can be located out of the danger zones and pipe or tubing will carry the lubricant to the point of use.

This safety guard is desirable but it also collects dust

In order to be consistent, however, it is necessary to have *all* hazardous lubricating points similarly equipped. The human memory is very short and the oiler, interested in the primary task of lubricating yet frequently with a wandering mind, does not always differentiate between safe and unsafe places. To have one place equipped and another not so provided with a safe lubricating arrangement is to court disaster. To the oiler all points to be oiled are simply places to be oiled. He will forget some are safe and some unsafe. Consequently *all* positions for administering the lubricant must be made safe.

The application of heavy lubricants such as grease can be performed in the same manner using proper piping, fittings and pressure guns.

Table 1 shows a portion of a lubrication chart which schedules the time for lubricating the different points of the particular machine.

Such charts for the entire plant are available to those specifically charged with the actual lubrication of the machinery and to the foreman or superintendent as well. By following this schedule the proper lubricant will be used in the right place and

TABLE 1—EXAMPLE OF LUBRICATING CHART

	Machine No.	Lubricant	Lubrication Period
21	Gear Reducer	Type W	28 days
	Chain	Type K	8 hours
	Sprocket Bear. Upper	Type B	8 hours
	Sprocket Bear. Lower	Type B	8 hours

*Consulting chemical engineer, York, Penn.

the possibility of a bearing running dry will be very remote. There should be some method of check as each piece of machinery is lubricated, so that the schedule may be followed without gaps.

Replacing Guards and Covers

In their zeal to get back into production a part or piece of equipment that required some maintenance work, the repair crew frequently neglects to replace guards and covers with which the machinery was originally provided. It is true that such guards or coverings sometimes are not absolutely necessary for the equipment to function, but they are necessary for the general well-being of the unit, whatever it may be. To operate such equipment without covers is to invite trouble and high maintenance costs.

The dust and grime nuisance can best be combatted at its source in the rotary kiln plant. Elevators must be completely enclosed. Screens can be enclosed or hooded to remove the dusty atmosphere. Bins into which dusty material is delivered should be covered. The expense of keeping down the dust and grime nuisance to some people seems totally unnecessary, but neither men nor machinery function at their best under conditions of filth and disorder. A man accustomed to slovenly working conditions seldom performs the job better than conditions demand.

Bearings and electric motors covered with dust and dirt cannot dispose of the frictional and electrical heat as can those not so encumbered.

Maintenance

The cost of mechanical maintenance of the rotary kiln operation no doubt will be found to be inversely proportional to the care and attention accorded the equipment during its operation and the thoroughness with which necessary repairs are made.

Most maintenance work is performed under the direction of the master mechanic. Now there's a man for you! He's supposed to be a composite of Houdini, Edison, Einstein and Thurston. A versatile chap to say the least. Out of his bag of magic (usually the scrap pile) and with his magic wands (the cutting torch and the electric welder) he will contrive anything from a trick cog-wheel to a set of spectacle-frames for the boss' mother-in-law. A thoughtful and considerate management generously provides him helpers; the best-trained horse wranglers and agriculturists in the neighborhood. His machine tools are the very essence of stamina and longevity, since they were built back in the days when the tool builders, now long since passed on, generously apportioned the cast-iron. His work house usually occupies some obscure corner of the plant site and stepping inside, it will be found more or less brilliantly illuminated through grimy windows by day and with powerful 40-watt lamps by night. Despite the modern inconveniences he somehow manages to do the job and keep the wheels of the industry turning.

The maintenance department will be immeasurably assisted in the performance of its duties if the operating department will lend its help. That is, by keeping a log of those parts or pieces that show signs of wear or failure before they actually cause a shut-down. Generally, during the course of six months or a year, a major shut-down takes place for refractory linings, etc. During these periods of idleness, the maintenance department can make practically all of the necessary repairs to put the equipment in first-class shape providing they know just which parts are in need of repair.

Table 2 shows a specimen portion of a log kept either by the rotary plant foreman or by the burners themselves.

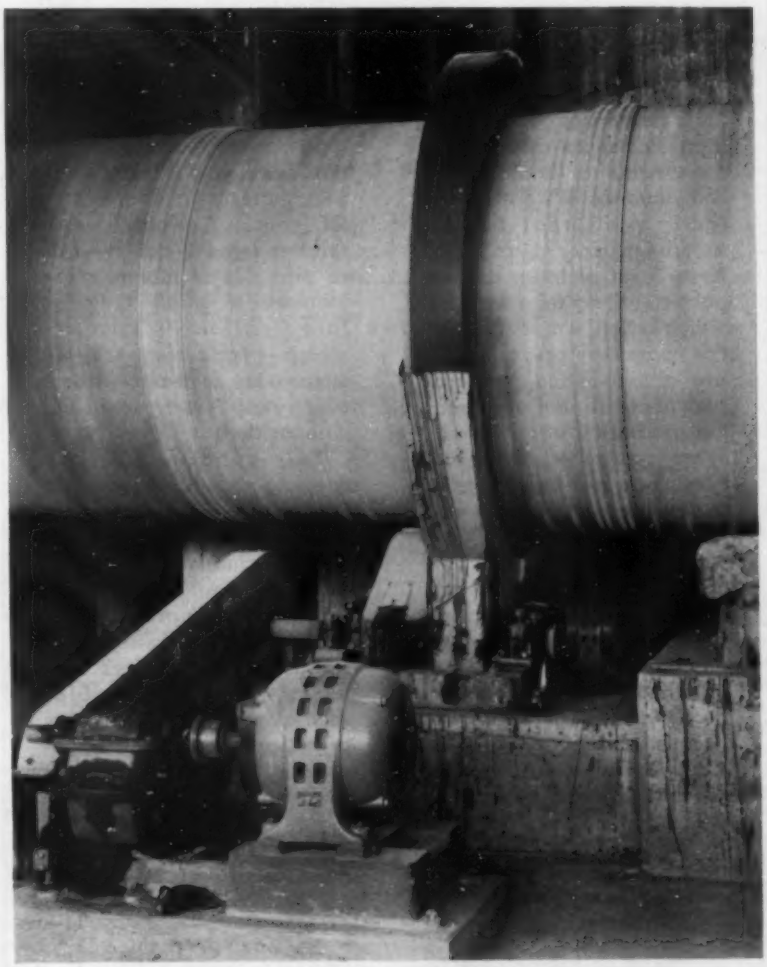
With such a log, whereon the daily items found to be faulty are recorded, the task of the repair departments is made much easier and a more thorough job can be done. From the above we can see that on 3/16/43 the lower

(Continued on page 68)

TABLE 2—MAINTENANCE AND REPAIR LOG

Plant No. 1

Machine No.	Date	Item	Repaired
21 Elev.	3/16/43	Lower sprocket badly worn.	4/8/43
21 Elev.	3/16/43	Hole worn in chute.	3/17/43
16 Mill	3/18/43	Motor bearing heating.	4/8/43
2 Kiln	3/23/43	Brick falling out of hood	4/8/43



Rotary kiln drive which is fairly up-to-date—yet the lubricant collects dust

Agstone

Mobilizing the Fertilizer Resources of Our Nation's Soil

Producers of mineral fertilizers should find this interesting explanation of soil chemistry of value in sales promotion

By DR. WILLIAM A. ALBRECHT*

THE PRODUCTIVITY of a soil is determined mainly by its delivery of ten chemical elements in effectively balanced amounts, since these nourish the plants directly and also enable them to use four additional elements coming from the air and water. Crop production depends on the successful management of the soil so that it delivers its plant nutrients or soil fertility to the crops. The fundamentals of the soil processes as they provide the raw materials to initiate and continue the manufacturing business of the growing plant, through which the sunshine power synthesizes the complex chemical compounds of vegetation, may well interest all of us.

All life depends on this natural chemical industry that draws on the soil for only about 5 or 10 percent of the plants makeup, while it draws on air and water for the remaining 95 or 90 percent. The decline of the fertility stores of the soil, that represent rock residues, is bringing these fundamentals into greater significance. It is well that we understand them while our efforts in conservation may still find sufficient of soil fertility left to be conserved. Fertility for future use is that which is in the rock and mineral reserves of the soil or that applied to the soil.

Chemical Elements Needed by Growing Plants

The bulk of all plants is combustible. They are therefore made up largely of carbon, so commonly combined with hydrogen and oxygen in the ratios by which the last two are found in water. This combination as carbohydrates in their various forms is the bulk of all vegetation. When to this chemical combination there is added some nitrogen, the compound becomes protein. For legume crops, these four elements, namely carbon, hydrogen, oxygen, and nitrogen, are supplied by the air and water. They are chemically combined by the energy of the sunshine. Carbohydrates in particular represent concentrated collections of chemical energy. As sugar, starch, cellulose, wood, and others, they represent fuel values in animal diets.

The protein also represents some energy collection, but more particularly it is the growth-promoting compound. Cell-multiplying capacity resides in it. If true proteins are to be produced—that is, if the nitrogen, and in some cases some phosphorus and some sulfur are to be coupled up with carbon, hydrogen and oxygen to make this life-carrying, body-building substance—they cannot be built

*Chairman, Soils Department, University of Missouri.

FOREWORD

● *DR. ALBRECHT sent me the manuscript of this article last summer after I had sent him copies of my editorials in the April and July issues, 1943, in which it was argued that pulverized rock other than limestone also should have value as fertilizers and soil builders. We knew perfectly well that fertilizer manufacturers, and they have a lot of influence, oppose anything as a fertilizer which is not "water soluble." For years they prevented the use of pulverized raw rock phosphate on that argument, but gradually, in the Middle West pulverized raw rock phosphate has been used in increasing amounts and with satisfactory results.*

Naturally, fertilizer manufacturers will oppose the use of other pulverized rock as sources of potassium, phosphorous, iron, sulphur and all the other minerals so necessary to plant growth because of their alleged "insolubility." Rocks like granite and others of igneous origin, are rich in these minerals, and soils formed by their natural disintegration are productive soils.

Dr. Albrecht, in this article, comes to our rescue with proof that pulverized rock, whether disintegrated by natural means or mechanically, is the real source of permanent soil fertility. It is better for continuous cropping not to have the plant food in too soluble condition, because if it is drainage gets more of it than plants. Of course "soluble" is a relative term. When crystals or particles of minerals are sufficiently small they go into "colloidal solution," which means they stay in suspension in water without changing their chemical composition.

This article of Dr. Albrecht's should be read and studied by all crushed stone producers, since it shows the soil mechanics by which mineral plant foods from pulverized rock are taken up by the plant, in spite of the fertilizer manufacturers' contentions that "insoluble" rock dusts are not fertilizers or soil builders. Their application to soils will result probably in slower, but more permanent, recovery of soil fertility, which from now on will be one of our greatest national technical problems.

(Nathan C. Rockwood)

by sunshine using only air and water. The soil must contribute at least 10 elements. These 10 include calcium, so common in limestone; phosphorus, common in bones and phosphatic rocks; potassium, abundant in wood ashes and many rocks; magnesium, common in dolomite; sulfur; iron; boron; manganese; copper; and zinc. With the soil's responsibility toward the plant, including as many as 10 elements, and with the shortage in any single element limiting the crop growth, is it any surprise that the problem of supplying the plants with their requisites may be a common one on some of our soil types?

Plant Composition Reflects Soil Fertility Supply

Every plant represents a skeletal structure for absorption of sunshine, intake of carbon dioxide from the air, and absorption of water and fertility from the soil. This structure can be roughly visualized as consisting of woody material much like a building's skeletal frame. Every plant has it. Some have but little more than merely a woody framework. We can then imagine the plant's manufacturing performances in constructing this woody mass largely of carbohydrates. Water, and carbon dioxide, both represented by the air and the weather, are the sources of this material.

Then, as the soil offers more of fertility to permit the manufacturing and synthesizing performances to move forward at greater intensity, the plants will contain higher concentrations of proteins, of minerals, and of other soil-borne substances to be put into abundant seed yield or larger tonnages of forage with high nutritional values for animal consumption. These are the manufacturing activities carried on within its woody frame structure. Roughly, we may view the plants as functioning to make products of value in animal body construction or in cell multiplication for their own growth from the fertility contributed by the soil. They make products mainly of fuel value from the contribution by air and water.

Vegetation can be classified, then, into two groups, the first being the woody, or the carbonaceous, group when the soil contributes little fertility and compels the plant to operate largely on water and weather. The second is the protein-containing and mineral-rich group, when the supply of soil fertility is large. Forest trees grow on soils of lower soil fertility, while legumes, such as alfalfa, demand higher soil fertility. The first of these two groups reflects the fuel value, and the second the nutritional service in body building, as we all know of alfalfa's service for promotion of growth in young livestock.

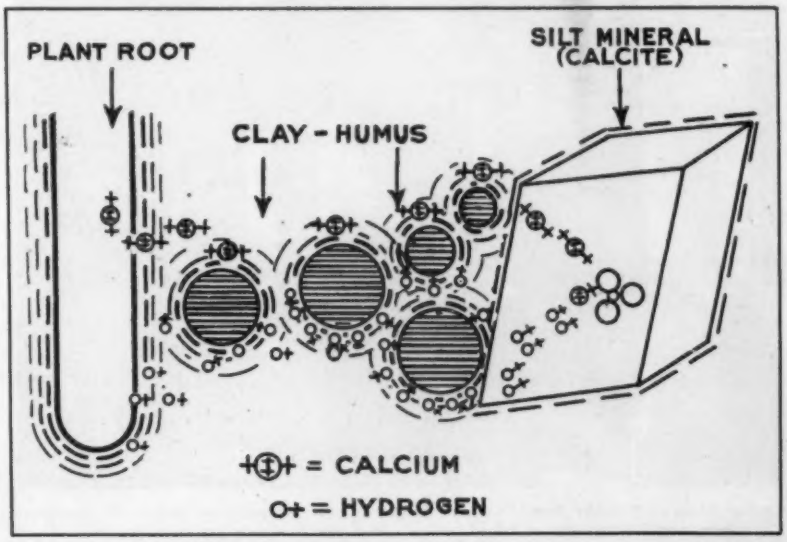


Fig. 1.—The mechanism of plant feeding. Plant nutrients, like calcium, on the colloid are exchanged for hydrogen. As the colloid clay and humus become exhausted, the nutrients move from the mineral to the root through the colloid while the hydrogen, or acidity, moves in the opposite direction

Not only in the different plants are these differences found, but even within a single kind of plant there is a similar variation in composition according to the soil fertility. Soybeans, for example, become more woody in character if grown on a limited supply of soil fertility. When more generously nourished, they become rich in protein and rich in minerals as legumes are expected to be. The soil fertility supply determines the plant composition, irrespective of the plant's pedigree or its parents as performers on some other soil.

Process of Mobilizing Fertility from Soil into Plants

Where within the soil are the plant nutrients stored, or where is the fertility retained? This is a question that must be answered if we are to appreciate the fertility problems of some of our soils. More baffling to many is the question, how can the plant get anything from the soil after water has been going through it so long to carry soluble materials away? One needs only to recall the universal practice of burying things in the soil to get rid of odors, or of filtering water through soil or charcoal to obtain clear water, to appreciate the natural phenomenon of adsorption by the soil. Filters are made of substances offering extensive surfaces by which materials in colloidal solution are taken out and held there safe from removal by more percolating water. The tremendous amount of surface in the clay fraction of the soil is the place on which plant nutrients are adsorbed. It is through this phenomenon of adsorption on its surface that clay serves in holding the fertility elements against loss by leaching and yet in readiness for delivery to the plant roots by exchange mainly for hydrogen given off by the plant.

Principles by Which Plants Feed on the Fertility of the Soil

Perhaps in the simplest way we can picture the plants' getting nourishment from the soil largely as a business of barter or trade. The root, as a colloid with its extensive surface giving off carbon dioxide that provides hydrogen, is in intimate contact with the clay surface on which fertility elements, such as calcium, magnesium, potassium and others are adsorbed. The hydrogen from the root is a positively charged ion and is traded or exchanged for those of similar charge on the clay. These positive ions, or nutrient cations, on going into the root are synthesized into complexes and carried up into the plant to clear the way for others to follow. Thus, the plant gains nutrients, or "takes" the soil fertility from the clay to reduce the fertility supply there and in turn to increase the supply of hydrogen on the clay surface.

The performance may be illustrated by means of the diagrammatic sketch, Fig. 1, in which the hydrogen is designated as moving from the root to the clay along the lower sides of the circles representing clay or humus colloids, while the calcium is moving from the clay to the root along the upper sides of the circles.

Since it is the hydrogen ion that represents acidity, or sourness to our taste, the increasing concentration of hydrogen on the clay means increasing soil acidity. Plant growth and its

Crusher set-up at Kentucky Stone Co., High Bridge, Ky., for production of agricultural limestone. Hammermill is V-belted to 100-hp. motor. Feed size is usually not more than 1-in.

removal of fertility from the soil is then truly a process that makes the soils more acid. In turn, the increasing soil acidity means an increasing degree of exhaustion of the fertility store from the soil. For plants growing on the more acid soils, then, we may expect that they are running a manufacturing business with an output of products with fuel- rather than growth-value. Acid soils are of low fertility and consequently of lower productivity. Their vegetation shifts toward that of mere fuel value.

Acid Soils Bespeaks Fertility Problems

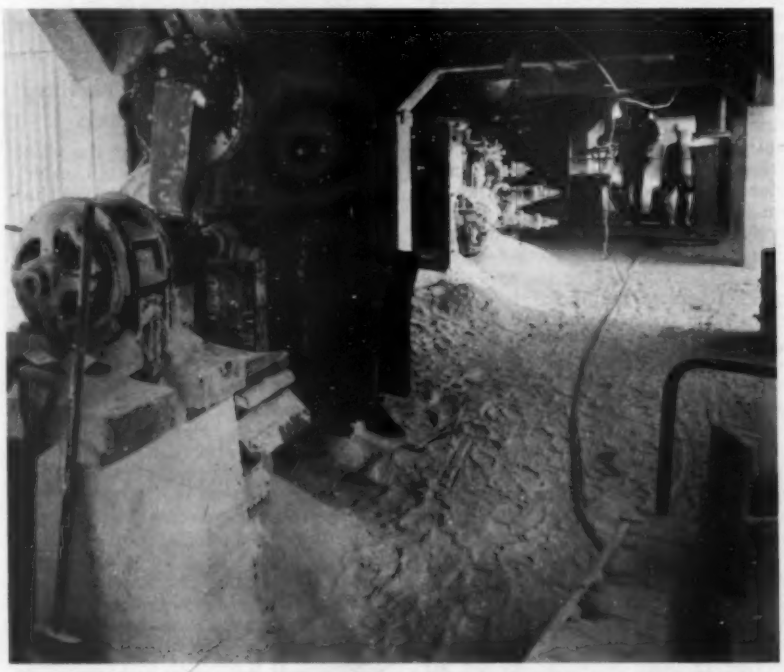
If the clay of our soils gives up its cationic supply of soil fertility in exchange for hydrogen from carbonic acid of root origin, the clay must do likewise to carbonic acid coming from the decaying organic matter within the soil. Percolating waters saturated with this acid, leach fertility from the soils and make them acid in a manner like that by the plant. Roots of cover crops can intercept this fertility and hold it as organic matter for the next crop. Missouri's location, for example, in the region of higher rainfall and of longer and warmer seasons means that natural weathering has given her the more leached soils, or those soils of lower fertility. As an indication of this fact, we need only to recall that our virgin soils had long been depleted to the point of producing only a woody vegetation, or a timber cover, before they were put under our cultivation. That we should plan for a highly proteinaceous crop like alfalfa on such soil implies immediately that we must expect to provide the extra fertility, and to reduce the hydrogen store on the clay to the extent presented by the fertility differences between the natural woody crop and the introduced proteinaceous one. The very nature of our soils brings a fertility problem with it.

Amount of Fertility Delivered by the Clay

If the plant obtains its nutrients through surface contact between the root and the clay because of the hydrogen as the root offering in exchange, the amount of nutrients so obtained from the clay of the soil will depend on three factors. The first of these is the total amount of root surface the plant has to offer per unit volume of soil. Densely rooted plants get more fertility than those only sparsely rooted. Bluegrass with 66 square inches of root surface per cubic inch of soil can take more by exchange than soybeans with only 2.5 square inches in the same soil volume. The second factor is the amount of clay surface, rather than surface of silt or sand the soil has, since little of fertility is adsorbed on these latter mineral particles of larger size. The third and important factor is the degree of saturation of the clay by the nutrients, rather than by hydrogen. Much clay in a soil means more chance for the roots to make contact with nutrient-carrying surfaces. Here is the reason why heavy clay soils are appreciated for their productivity, even if often hated because of their intractability. Ancient civilizations on sandy soils have not been long-lived. Those on clay soil have persisted through centuries. Regions of older civilizations today are on soils of high clay content, because only such a soil would retain its productivity through those long periods of cultivation. But by far most effective in raising the productivity of the clay is the degree to which it is saturated with fertility rather than with hydrogen, or with infertility. This variation in degree of saturation is the hidden condition that is not recognized, and in it many of our soil problems originate. By it much can be done for their solution.

Though many soils tend to be high in acidity, it is well to remember that if a soil can hold much hydrogen to

(Continued on page 90)



Agstone is occasionally placed in paper bags as shown in the foreground but most of the production is handled in bulk for farm distribution

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The KENNEDY Preheater and Deheater provides a complete answer to the lime producers who want to combine the superior product of a rotary kiln with the operating economy of a vertical kiln.

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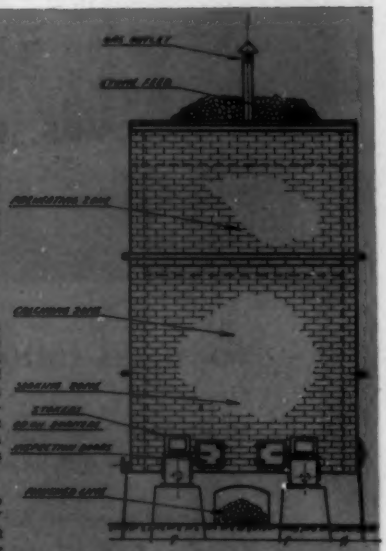

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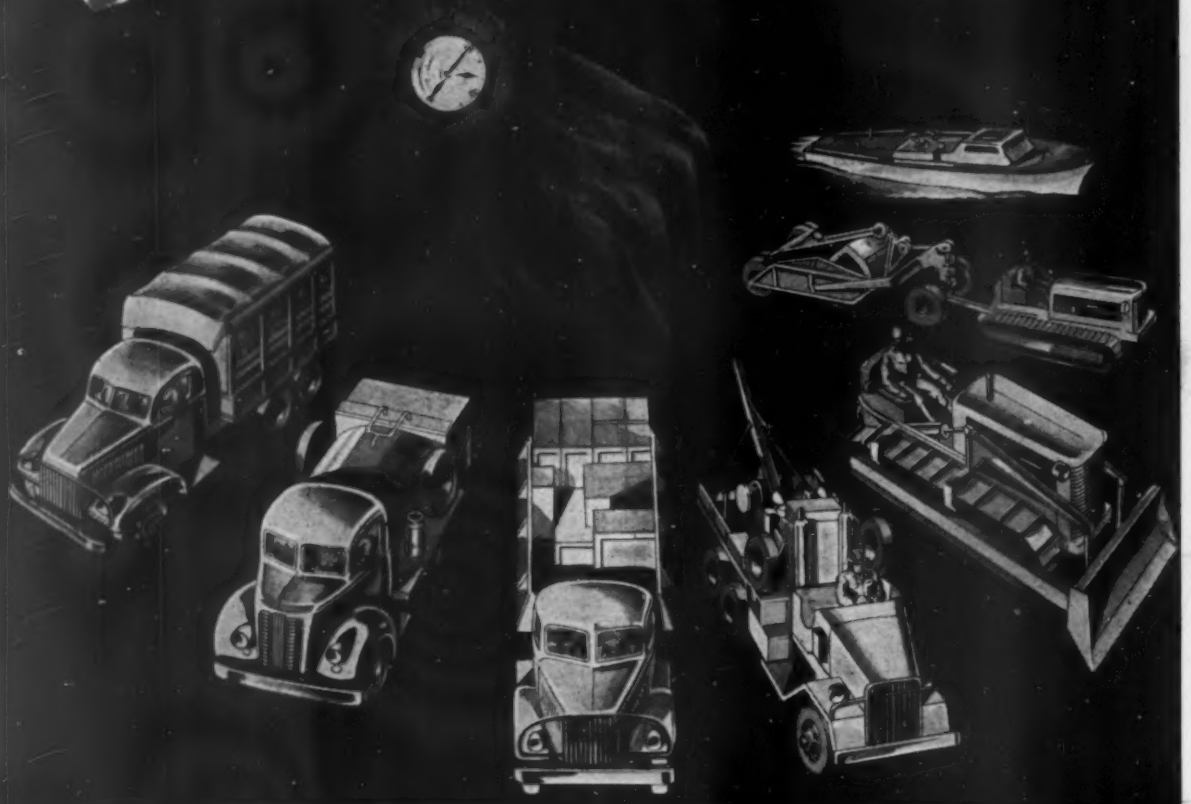

WHEN THE SIGNAL COMES for invasion, the United States Armed Forces, according to present estimates, will have approximately 11,000,000 men ready for combat.

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A. A. A. Program Stimulating Use of Agricultural Limestone

By DONALD W. AITKEN†

I SHOULD LIKE at the outset to emphasize that the A.A.A. is completely on a war footing. The Agency has been assigned important duties in connection with the Government's food production program, and in carrying out those duties, we are using all the weapons at our command. All of you know that one of the most valuable of these weapons is agricultural limestone. You, in producing lime, and we, in promoting its use on the farm lands of America, are engaged in war work just as truly as though we were building machine tools to be used in the production of tanks.

It was no accident that the volume of agricultural production for each of the last seven years successively exceeded that of every other year in history, and that total production in 1943 was 50 percent higher than in any year during the last war. Increased yields per acre have accounted for a large part of this, and there can be no question that the A.A.A. soil building program, including expanded use of lime, contributed greatly to it. The use of liming materials by farmers has risen from a level between 3 and 4 million tons prior to the program to more than 20 million tons in 1942—more than a 5-fold gain. This is a marvelous record and one in which you as suppliers of the material can take justifiable pride. Grateful consumers of American farm products everywhere give their thanks.

Two Basic Responsibilities

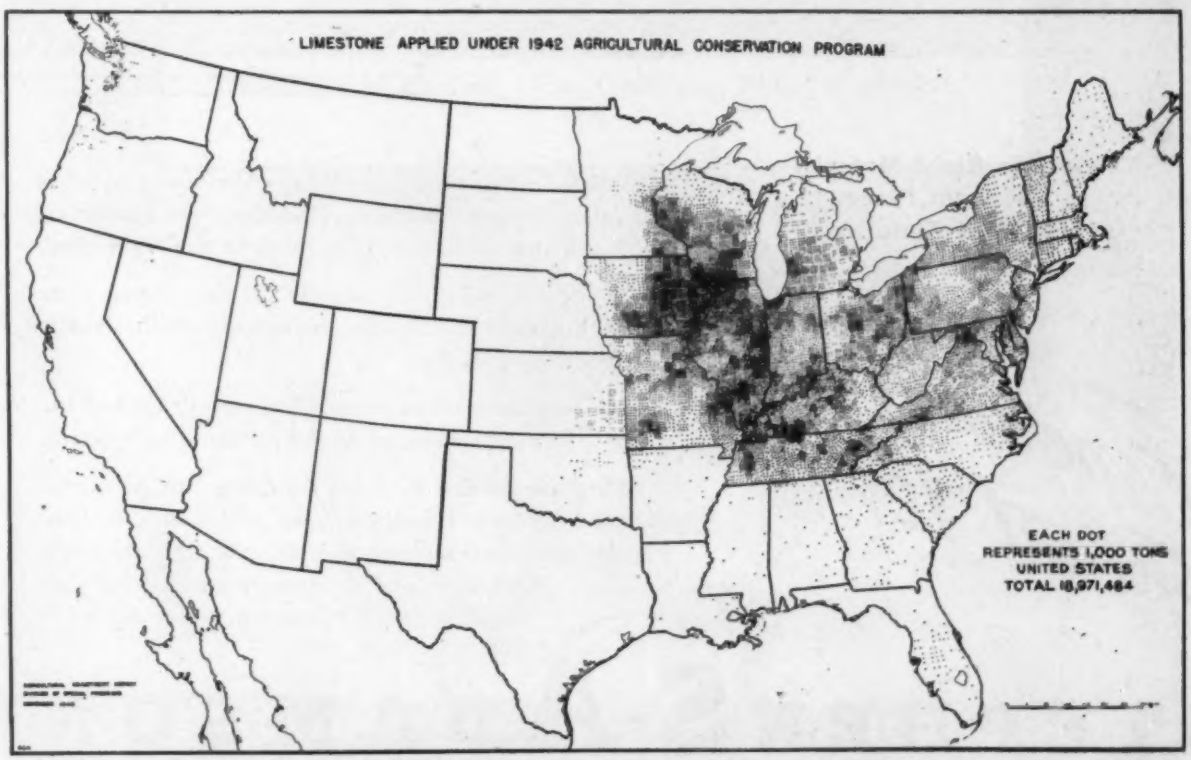
We are to discuss plans for 1944. The A.A.A. has two basic responsibilities in connection with the war food program. First is to influence farmers in adjusting crop acreages to the extent necessary to meet the record goals that have been set. In view of the limitations upon farm machinery, labor, and other facilities for production, these shifts create many difficult problems for farmers. Knowing the needs for their products, we are convinced that they will go all-out this year. Our second major responsibility is to influence farmers in the adoption of soil-building measures which will contribute most to increased production immediately, as well as to help prevent the erosion of our soil resources. Obviously, these two activities represent vital cogs in wartime machinery for food production. To help carry them out, the farmer-elected committeemen in every community of the land are earnestly devoting their best efforts.

In our office, we frequently look back over where we have been in order to plan for the future. So far as limestone is concerned, the picture is shown on the map, Fig. 1. I should like to point out that these data (Table 2) represent all liming materials. No segregation has been made of quantities obtained through A.A.A.

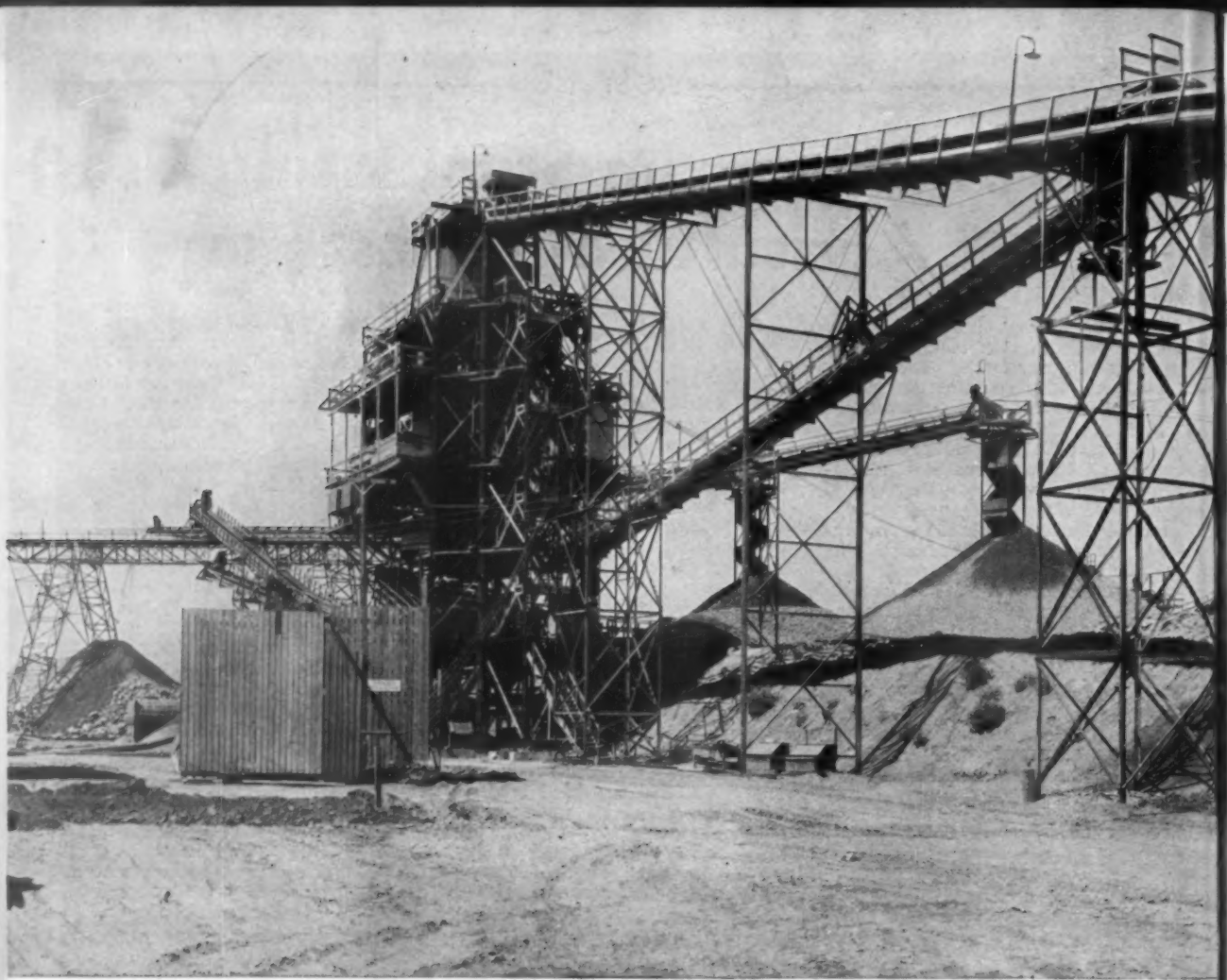
(Continued on page 66)

*From a talk before the National Crushed Stone Association, February, 1944.

†Division of Special Programs, A.A.A., Washington, D. C.



Map showing distribution of agricultural limestone in the United States



An "S-A Engineered" system at a large aggregate plant, using numerous S-A belt conveyors, vibrating screens, etc.

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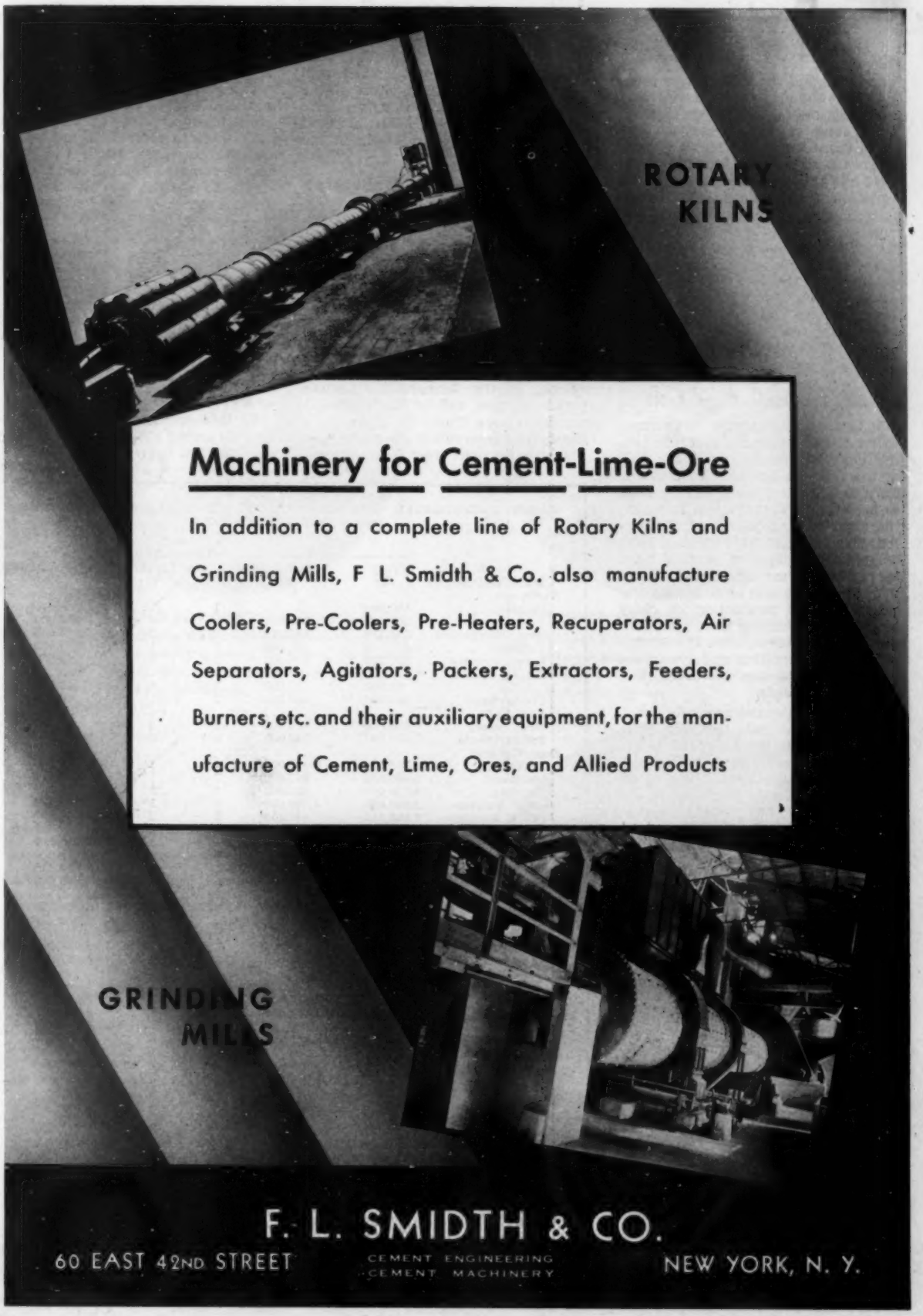
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(Continued from page 63)

purchases and those bought by farmers individually. The material used on farms taking part in the agricultural conservation program includes both these amounts. There is some discrepancy between the figures for 1942 and those released earlier by the National Lime Association. We believe this may result from incompleteness in certain of the N.L.A. figures. I desire to emphasize particularly the figure of 16 million tons for 1943. No matter how you look at it that is a disappointing figure. It does more than indicate that progress was arrested last year; it points out a regression that took place when it could ill be afforded.

Big Problem—Corn Belt!

It takes only a glance at the map to recognize where most of the production problems lie. Since the bulk of the tonnage has been used in the Corn Belt States, much of the work to be done is in that area. However, the grasslands of Kentucky, Tennessee, Virginia, and West Virginia have only begun to receive part of what they need. From Minnesota across the Lake States and on to Maine, the sustained high production of dairy products is depending more and more heavily on the use of lime. The Southern States are getting under way but still represent a vast unworked field of limestone needs.

Estimated potential needs for limestone show how little has been done thus far. Careful studies of this problem reveal clearly that if the real requirements of our soils are to be met farmers year by year need to use about double the record tonnage which was applied in 1942. Naturally, the farmer must understand the importance of the material and genuinely desire to use it. We believe the Agricultural Conservation Program and supporting educational activities of Extension workers and others are sufficient to bring this about. Likewise, the volume of material must be adequate. The A.A.A. is prepared to use its full facilities as never before to back up the industry in helping to get this job done.

In most States our field people have surveyed the situation both in regard to production and delivery to find out what is needed and how we can best be of service. We found some members of the industry up against all the shortages and bottlenecks which apparently could beset operations. In this connection we found local agencies which were grouping some ration boards, draft boards, and limestone production with run-of-the-mine non-essential industries. Evidently a poor job had been done in informing those people of the importance of lime in increasing food production. Since removal of the handicaps is a problem which will require the determined effort of the War Food Administration, we have asked the Office of Materials and Facilities to give special help in the situation.

Maximum Help to Producers

The Agricultural Conservation Program for 1944 has been developed so as to give maximum help in promoting the use of liming materials. By the elimination of some previous conservation practices, more emphasis is placed upon the use of limestone. Rates of payment offered farmers for applying the material generally have increased. The financing of spreading the limestone on the fields has been shifted to the farmer. The budget which is now before the Congress provides more funds to make payments for conservation practices than for any previous year. The appropriation item is ear-marked exclusively for this use.

Our contracting procedure has been modified so that in some areas limestone producers may choose whether they wish to commit themselves for definite tonnages which the A.A.A. will be required to order and the producer to deliver, or use the more flexible source-of-supply arrangement under which both the A.A.A. and the producer can alter their commitments from time to time as circumstances dictate. Both types of contracting have their place. We want to be certain that, where assurance of maximum production is dependent upon satisfying a general demand for the two alternatives, we are prepared to meet it.

Shipments the Year Around

In 1944, we shall continue our efforts to spread the takings by farmers over the full twelve months. We had

(Continued on page 68)

TABLE 1—ESTIMATED ANNUAL TONNAGE OF LIMESTONE REQUIRED FOR FIRST APPLICATION

State and Region	Acres[1] Crop (1)	Acres[1] Pasture (2)	Rate Per Acre—Tons Crop (3)	Rate Per Acre—Tons Pasture (4)	First 10 Years Tons—Annual (5)
Northeast					
Maine	400,000[4]	.....	1	..	.....
	500,000	300,000	2	2	200,000
New Hampshire	354,706	147,112	2½	2½	125,455
Vermont	877,176	561,000	2	1	231,935
Massachusetts	557,790	446,668	2	3	245,558
Rhode Island	.....	32,000[3]	..	..	.....
	62,000	15,000[6]	2½	2½	27,250
Connecticut	250,000	100,000	2	1	60,000
New York	.....	.....	..	..	.....
New Jersey	900,000	100,000	2	2	200,000
Pennsylvania	7,200,000	1,500,000	2½	2½	2,175,000
East Central					
Delaware	350,000	50,000	1¼	1¼	50,000
Maryland	1,600,000	250,000	2	1	345,000
Virginia	4,770,000	3,632,000	2	2	1,680,800
West Virginia	2,000,000	2,000,000	2	1	600,000
North Carolina	7,835,585	1,376,455	2	2	1,842,408
Kentucky	3,171,700	3,828,300	2	2	1,400,000
Tennessee[2]	.....	.....	..	..	2,000,000
Southern					
Alabama	8,223,542	2,300,000	1	1	1,052,354
Arkansas[2]	.....	.....	..	..	300,000
Florida	.....	.....	..	..	.....
Georgia	5,088,600	1,643,000	2	2	1,346,320
Louisiana	.....	.....	..	..	.....
Mississippi	.....	.....	..	..	.....
Oklahoma[2]	6,689,600	.....	1½	..	1,034,400
South Carolina	4,925,000	600,000	3	3	1,657,500
Texas	.....	.....	..	..	.....
North Central					
Illinois	8,285,000	9,215,000	2	2	3,500,000
Indiana	11,529,000	2,468,000	2	2	2,799,400
Iowa[2]	.....	.....	..	..	3,000,000
Michigan	4,124,606	1,358,484	2	2	1,096,600
Minnesota	.....	.....	..	..	.....
Missouri	8,000,000	9,000,000	2	2	3,400,000
Wisconsin	8,000,000	1,500,000	2½	2½	2,375,000
Ohio	3,300,000	3,160,000	2½	1½	.....
	4,200,000	220,000	1½	1	1,951,000
Western					
Kansas	3,125,000	600,000	2	2	745,000
Oregon	.....	.....	..	..	.....
Washington	.....	.....	..	..	.....
Total					35,430,980

[1] Acreage limed within last 10 years not included.
[2] No data on pasture acres or rate.
[3] Estimate on incomplete information.
[4] Potatoes.
[5] Plowable.
[6] Non-plowable.

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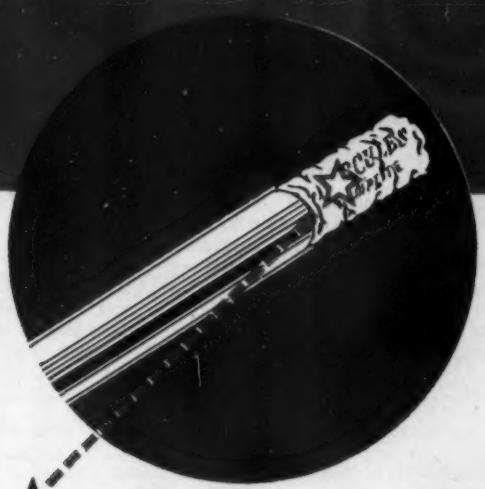

2 **TIGHTER CHARGING** is bound to result because both dynamite and the Tamptite wrapper expand to fill the bore hole tightly, snugly. Virtually no air space remains around the charge.

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3 **BETTER BREAKAGE** of the ore or rock occurs because the entire charge is concentrated exactly where you want it. The result is speedier mucking and a faster mining cycle.

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ORDER HERCULES EXPLOSIVES IN TAMPTITE CARTRIDGES

(Continued from page 66)

an excellent accomplishment in this respect last year. At all times we had more orders than he could fill in the hands of nearly every producer under contract. Perhaps if you producers had been able to surmount all your obstacles, this would not have been the case. We will not object to having to scurry around to keep you supplied with sufficient orders to utilize your full capacity! One important point on extending deliveries over the whole year: limestone must move whether or not weather permits spreading. If we do not take advantage of every weather-working day to get lime to farmers, we cannot reach our goal.

In the distribution of limestone, the A.A.A. fortunately is able to participate more as a means for bringing the producer and the farmer together than as an actual middleman. The flow of limestone from quarry to farm has, in general, been kept within the customary trade channels, with the A.A.A. assembling orders and collecting payment. This has enabled the producer to concentrate entirely upon the problems of quarrying, processing and delivering. Our participation is solely a means to an end; we have no other motives whatever.

Table 2 is an estimate of the liming material requirements for A.A.A. purchases during the two six-months' periods of this year, side by side with preliminary data on orders placed and deliveries made during 1943. Briefly, we fell short 2 million tons in getting deliveries against the orders placed by farmers. Orders for thousands of tons more—at least up to the estimated requirements for 1944—would have been placed if we had not found it necessary to discourage farmers from placing them. This year we intend to take orders up to the level of these requirements and place them with the industry. In addition you will have responsibility for the distribution of the tonnage purchased through your normal channels. For 1944, then—at least 22 million tons and as much more as you can turn out.

Well, there is the goal. We have our sights set high because of our conviction that no stone must be left unturned to assure the maintenance of soil-productivity at a maximum level. We are going to provide farmers with every inducement to use limestone in 1944, and we are going to provide you men in the industry with every inducement to produce and distribute it.

TABLE 2—LIMESTONE PRODUCTION AND REQUIREMENTS

Region, State	1943 Orders placed	1943 Orders filled	1944 Estimated Requirements Total	Jan.-June	July-Dec.
East Central					
Delaware	4,600	4,300	15,000	7,500	7,500
Maryland	73,000	63,000	140,000	55,000	85,000
Virginia	523,000	473,000	703,500	324,300	379,200
West Virginia	415,000	360,000	300,000	99,200	200,800
North Carolina	470,000	450,000	597,000	300,000	297,000
Kentucky	450,000	370,000	941,743	475,000	466,743
Tennessee	742,000	665,000	1,039,750	416,550	623,200
Totals	2,677,600	2,385,300	3,736,993	1,677,550	2,059,443
North Central					
Illinois	1,204,504	944,502	1,500,000	700,000	800,000
Indiana	1,282,302	916,667	1,000,000	500,000	500,000
Iowa	969,275	758,045	960,000	360,000	600,000
Michigan	490,840	476,319	850,000	500,000	350,000
Minnesota	281,145	256,420	350,000	200,000	150,000
Missouri	1,244,340	945,719	1,250,000	550,000	700,000
Ohio	898,741	729,409	1,000,000	400,000	600,000
Wisconsin	700,508	615,686	1,000,000	600,000	400,000
Totals	7,051,655	5,642,767	7,910,000	3,810,000	4,100,000
Northeast					
Maine	66,047	58,674	74,030	36,000	38,030
New Hampshire	27,692	21,040	29,162	14,000	15,162
Vermont	87,444	65,288	104,122	55,000	49,122
Massachusetts	42,007	31,467	58,857	35,000	23,857
Rhode Island	6,017	4,431	6,389	3,000	3,389
Connecticut	46,370	36,627	54,959	31,000	23,959
New York	457,500	361,772	712,721	450,000	262,721
New Jersey	80,960	54,037	124,172	70,000	54,172
Pennsylvania	599,980	555,783	1,000,000	600,000	400,000
Totals	1,414,417	1,189,119	2,164,412	1,294,000	870,412
Southern					
Alabama	137,256	134,256	100,000	65,000	35,000
Arkansas	66,177	51,177	85,000	60,000	25,000
Florida	8,339	7,699	65,000	35,000	30,000
Georgia	56,851	52,623	100,000	70,000	30,000
Louisiana	13,703	7,151	79,000	50,000	29,000
Mississippi	69,483	60,305	200,000	120,000	80,000
Oklahoma	19,244	15,244	65,000	45,000	20,000
South Carolina	110,274	104,551	300,000	200,000	100,000
Texas	600	600	45,000	30,000	15,000
Totals	482,287	433,246	1,039,000	675,000	364,000
Western					
Kansas	134,390	112,724	140,000	60,000	80,000
Oregon	5,617	5,617	11,500	5,000	6,500
Washington	522	522	2,500	1,000	1,500
Totals	140,529	118,863	154,000	66,000	88,000
GRAND TOTALS	11,766,488	9,769,295	15,004,405	7,522,550	7,481,855

Lubrication of Kilns

(Continued from page 57)

sprocket of machine No. 21, which is a chain elevator, is badly worn, but will run for some time. It is not desirable to stop the operation to make the repair. The chute was patched the following day without stopping the operation. The one bearing of the mill motor was observed to heat on 3/18/43, but it was not considered serious enough to shut down the operation to make an immediate repair. The same with the hood from which some spalls were falling. However, on the 4/8/43 there was a major shut-down, and all miscellaneous items of the log were checked and necessary repairs made.

In any rotary kiln operation maintenance lost time is a serious element of plant costs. If it is a kiln of any size at all, it costs from $20 to $100 per hour to have the kiln out of production. Consequently it is well worth while to have the teamwork of the plant and associated departments so well managed and organized that the lost time is a minimum.

(To be continued)

Protect Children Against Blasting Dangers

EACH YEAR many children are blinded, maimed, or killed as a result of playing with blasting caps carelessly stored. To prevent accidents of this kind, the Bureau of mines has issued a report, Information Circular 7275, "Accidents to Children from Blasting Caps," by D. Harrington and R. G. Warncke, which outlines simple rules to keep blasting caps from children. The rules apply to the users of explosives, who should store blasting caps safely; to parents, who should warn their children of the dangers of playing with explosives and discipline them against stealing; and to schools, which could teach children to recognize blasting caps and to leave them alone.

The Institute of Makers of Explosives, which initiated this safety program in 1926, also is joining in the program of prevention of accidents from the careless handling of explosives that permits children to obtain blasting caps.

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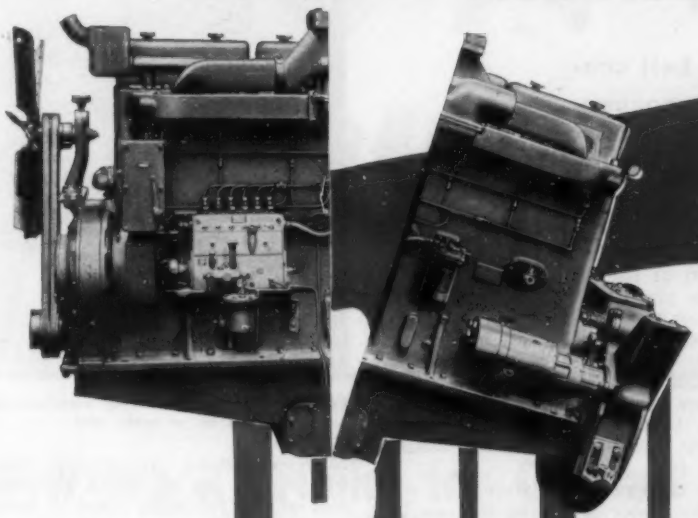

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Practical Suggestions for Conveyor Belt Operation

Part 9: Selection of belt conveyor on basis of economy

By MELVIN C. DOW* and HARVEY A. HARNDEN†

Extreme edge wear caused by untrained belt wearing on guide idler

IN THE DESIGN and layout of belt conveyors the operator does not often have the opportunity of selecting what he considers to be the ideal equipment for the job. More often certain concessions have to be made in order to use equipment already on hand; or in order to keep the amount of spare parts carried to a minimum, it is necessary to select equipment similar in size to that already in use at the plant. Sometimes, however, he is able to select a conveyor without limiting restrictions, and when this is the case, it might be well to take up the factors that he should consider.

Since each conveyor installation as an economic problem must be considered by itself, no rule or formula can be given that would permit the operator to easily make an economical selection, but he can investigate several possibilities before selecting the equipment. By so doing he will be more likely to select the ideal conveyor. That is the one which during its life carries stone at the lowest yearly cost.

The cheapest installation with regard to first cost will be the one in which the following items are least:

1—Belt
2—Idlers
3—Pulleys
4—Drive Reduction
5—Motor

Unfortunately the problem does not end there as all of us know from experience, for the most economical conveyor figured on a yearly basis will be the one in which the total cost of the following items is least:

1—Interest on original first cost
2—Power
3—Maintenance
4—Repairs
5—Depreciation

Before any comparisons of first costs are made it will be necessary to select the width of the belt based on

(Continued on page 72)

*Chief engineer, New York Trap Rock Corp., Newburgh, N. Y.
†Formerly with Engineering Department, New York Trap Rock Corp.

Two conveyors in single gallery showing ideal working space. Note safety crossovers in the foreground

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IF YOU'VE GOT A MACK, YOU'RE LUCKY...
IF YOU PLAN TO GET ONE, YOU'RE WISE!

(Continued from page 70)

the capacity desired and the speed at which it is decided to operate the conveyor. Generally, there will be a choice between a wide belt at a slow speed and a narrower belt at a higher speed. Where loading conditions permit, the narrow belt at high speed will be more economical. It must be remembered, however, that the belt must be selected to carry its peak load and wide enough for the maximum size of the lumps to be carried. Where abrasion of the cover is severe, the wider belt at a lower speed will often be found to be more economical since a belt traveling at a slower speed passes the loading point less frequently. It is sometimes found that in selecting a belt a greater number of plies are required for strength than are allowed for troughing. In this case, a wider belt will be required. Whatever width belt is selected, if economical service is expected the belt should be fully loaded most of the time so that the cover will wear equally across its width, and so that the cover will not be gone when the carcass is still good.

Figuring Power Requirements for the Conveyor

After the width and speed of the belt have been decided upon, it is necessary to calculate the power that the conveyor will use before any cost comparison between different selections can be made. In doing this, it would be well to determine the power requirements with plain bearing idlers and with anti-friction idlers. (For methods of calculating the power requirements the reader is referred to the Goodyear handbook and ROCK PRODUCTS, April, 1932.) The amount of power required will affect the thickness of the belt and the size of the driving machinery. These factors will be found to vary more in the longer and larger installations.

In considering the power of an ordinary conveyor installation, that is a level or an elevating conveyor, the power is considered as being made up of two items: first, the power to convey or transport the belt and the material; and second, the power to elevate the load. Declining or "down hill" conveyors require special consideration. Of the two factors mentioned above, the type of idlers will affect only the power to carry the belt and load. It will have no effect upon the power to elevate the load. From this fact it can be seen that anti-friction idlers will show the greatest percentage in power saving in long level conveyors. However, it is suggested that for all important conveyors, the power requirements with each type of idler should be figured.

(To be continued)

More Mexican Cement

To MEET the increased needs of a large road construction program and other building activities, Mexico is expanding its domestic capacity for the production of cement.

According to an economic review published by the National Bank of Mexico, cement production from eight domestic plants increased in 1943 to 744,000 tons from 584,000 in 1942. This included production from a new plant opened last year at Guadalajara.

This year new plants are scheduled to begin operations at Lagunas, Mazatlan, Tlalnepontla and Monterrey. It is also planned to place in operation the old plant in Monterrey as well as new units in Mixcoac, Cuernavaca, and possibly one or two in Orizaba. Total capacity will aggregate 1,494,050 tons of cement, which indicates a 300 percent increase over 1942 capacity.

Temporary Shut-Down

ASH GROVE LIME & PORTLAND CEMENT Co., Chanute, Kans., plant has suspended production with bins full. Guy O. Gardner, superintendent has advised that this is the first shut-down of the plant since 1937. Demand for cement will determine the length of the shut-down.

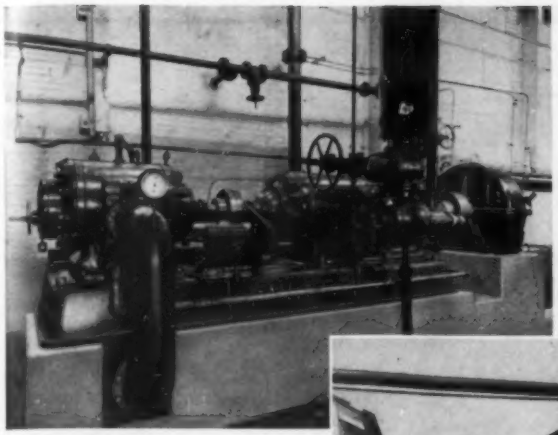
Agstone Requirements

PRODUCERS of agricultural limestone need not be concerned about future markets for their product. According to the tabulation given below, the A.A.A. estimates of agstone required to maintain soil fertility are sufficient to assure maximum plant production for the next ten years.

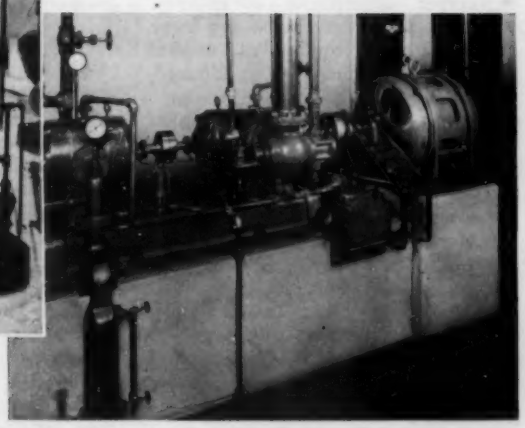
ESTIMATED ANNUAL TONNAGE OF LIMESTONE REQUIRED FOR MAINTENANCE

State and Region	Acres[1] Crop (1)	Acres[1] Pasture (2)	Maintenance Rate Per Acre—Tons Crop (3)	Maintenance Rate Per Acre—Tons Pasture (4)	Maintenance After First 10 Years[2] Tons—Annual (5)
Northeast					
Maine	400,000[4]	.....	¼	..	.....
	500,000	300,000	1¼	1¼	105,000
New Hampshire	354,706	147,112	1	1	50,181
Vermont	877,176	561,000	2	1	231,535
Massachusetts	557,790	446,668	1	1	100,446
Rhode Island	.....	32,000[5]	..	2	.....
	62,000	15,000[6]	2	1[6]	20,300
Connecticut	365,000	150,000	2¾	.85	113,125
New York	.....	.....	..	..	.....
New Jersey	900,000	100,000	2	2	200,000
Pennsylvania	7,200,000	1,500,000	2½	2½	2,175,000
East Central					
Delaware	50,000	50,000[7]	2	2	.....
	350,000	50,000[8]	1	1	60,000
Maryland	1,600,000	250,000	2	1¼	222,500
Virginia	4,770,000	3,632,000	2	1¼	1,408,250
West Virginia	2,000,000	2,000,000	2½	1¼	750,000
North Carolina	7,835,585	1,376,455	2	2	1,842,408
Kentucky	5,437,200	6,562,800	2	2	2,400,000
Tennessee[3]	.....	.....	..	..	2,000,000
Southern					
Alabama	8,223,542	2,300,000	2	2	1,052,354
Arkansas[3]	.....	.....	..	..	300,000
Florida	.....	.....	..	..	.....
Georgia	5,088,600	1,643,000	2	2	1,346,320
Louisiana	.....	.....	..	..	.....
Mississippi	.....	.....	..	..	.....
Oklahoma	.....	.....	..	..	.....
South Carolina	4,925,000	600,000	2	2	1,105,000
Texas	.....	.....	..	..	.....
North Central					
Illinois	15,785,000	9,215,000	⅝	⅝	2,000,000
Indiana	11,529,000	2,468,000	2	2	2,799,400
Iowa[3]	.....	.....	..	..	3,000,000
Michigan	4,124,606	1,358,484	2	2	1,096,600
Minnesota	.....	.....	..	..	.....
Missouri	11,000,000	9,000,000	1½	1½	3,000,000
Wisconsin	8,000,000	1,500,000	1	1	950,000
Ohio	3,300,000	3,160,000	2	1	.....
Western	7,000,000	440,000	.87	½	1,607,800
Kansas	4,275,000	600,000	.62	.62	304,700
Oregon	.....	.....	..	..	.....
Washington	.....	.....	..	..	.....
Total					30,234,919

[1] Acreage includes that limed last few years.
[2] Assumed that land all limed during last 10 years.
[3] Estimate on incomplete information.
[4] Potatoes.
[5] Plowable.
[6] Non-plowable.
[7] High-limed.
[8] Low-limed.



ROTARY
FULLER
COMPRESSORS



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Write for Bulletin C-5, fully illustrating and describing Fuller Rotaries.

C-96

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Control and Collection of Industrial Dust

Part 6: Rotary Type Dust Collectors

By E. D. POWERS

THE ROTARY TYPE COLLECTOR has a number of definite advantages, the most important being low cost and small space requirements. It can also be used in place of an induced fan where a draft is required, thereby performing the dual function of dust collector and exhauster. When used in that capacity, the pressure drop is usually much less than the total of a blower or exhauster and a dust collector. It can be used for handling gas up to 700 deg. F., but at the higher temperatures water cooled bearings are required. Some manufacturers recommend this type of equipment for abrasive dusts, and provide replaceable liners, and, in some cases, replaceable rotor blades. Under certain conditions they may be satisfactory but generally speaking the problem should be considered very carefully before selecting a rotary type collector for abrasive dust. In practically all cases, where a fan is needed in conjunction with a collection system handling abrasive dust, the fan is placed on the clean air side of the collector to avoid erosion of the fan mechanism.

Three Types of Rotary Collectors

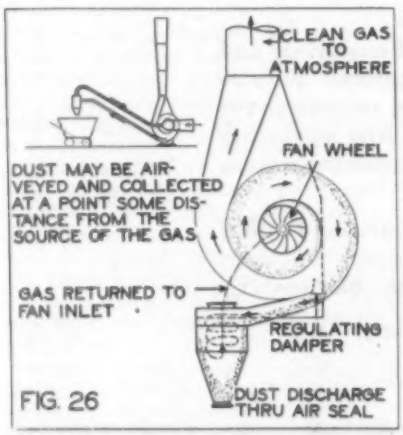
The collector shown in Fig. 26 was developed primarily for steam power plants, but in recent years has been used very successfully in many industrial applications. The dust laden gas enters through the center suction common to fans generally. The gas is forced through the exaggerated scroll by the rotor revolving with a top speed of 5,000 to 10,000 ft. per minute. This action causes the concentration of dust at the outer periphery where it is skimmed off along with 10% to 20% of the gas, and passes into an auxiliary cyclone type collector where the actual separation of dust from the gas takes place. It can be seen from this that the overall collection efficiency of the installation will be the efficiency of the scroll concentrator times the efficiency of the separation in the cyclone. In other words, if 10% of the dust fails to pass through the skimmer and leaves with the exhaust gas, and the separation efficiency in the cyclone is 80%, the overall collection efficiency will be .8 × .9=72%.

The above is based upon exhausting the gas which enters the cyclone to atmosphere. If instead, it is drawn back into the concentrator through the suction inlet and recirculated, the overall efficiency might be as high as 90% depending upon the nature of the dust. The rehandling of the gas, naturally increases the size of the equipment and of course the power cost. The skimmer gate is hinged so that the percentage of gas drawn through the cyclone can be varied with the plant requirements. If for any reason, the volume of gas to be handled is reduced, the skimmer can be opened with a consequent improvement in overall efficiency. Under unusual conditions the skimmer can be closed and the unit used as a fan in which case the total gas volume handled can be increased by the amount which is ordinarily recirculated.

Center Suction Inlet Type

The collector shown in Fig. 27 is made in a great number of standard sizes from 150 to 50,000 c.f.m. In this unit the air enters through the center suction inlet. The dust particles are concentrated along the vanes of the rotor and forced into the outer periphery, by centrifugal action, where they pass through a narrow annular opening into a dust release passage. The clean air flows into the

(Continued on page 94)


CLEAN GAS TO ATMOSPHERE
FAN WHEEL
DUST MAY BE AIR-VEYED AND COLLECTED AT A POINT SOME DISTANCE FROM THE SOURCE OF THE GAS
GAS RETURNED TO FAN INLET
REGULATING DAMPER
DUST DISCHARGE THRU AIR SEAL
FIG. 26

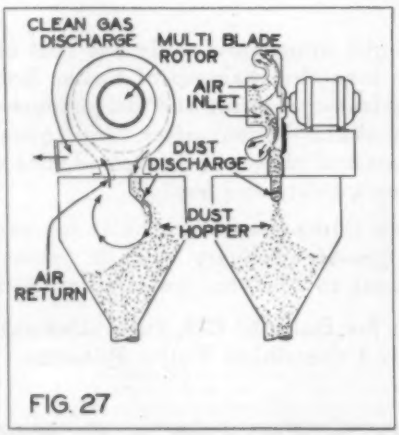


FIG. 27

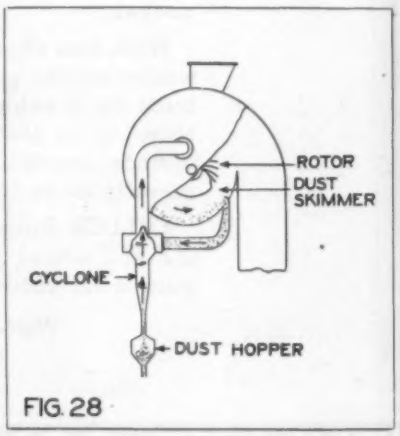


FIG. 28

Three types of rotary dust collectors. Fig. 26: Dust laden air-gas enters through center suction and is forced through the scroll by the rotor revolving with a top speed of 5,000 to 10,000 f.p.m. Fig. 27: Dust particles are concentrated along vanes of the rotor and forced into outer periphery, passing into a narrow annular opening into a dust release passage. Fig. 28: Rotary collector designed primarily for stoker-fired boilers. It is in effect a paddle wheel fan with a portion of the dust skimmed off and separated in a cyclone

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INFORMATION

TO HELP YOU MEET TODAY'S PROBLEMS AND TO MAKE PLANS FOR TOMORROW

You can obtain catalogs listed on these pages by merely checking and mailing the coupon below.

1 BELT HOOKS—Jewell Belt Hook Co. has issued a folder on belt hooks. Instructions for applying these hooks, price schedules and illustrations are shown in the bulletin.

2 BUCKETS—The Hayward Co. has published three new booklets (O-321, O-322 and O-323) on the care and maintenance of orange peel, clamshell and electric motor buckets. These booklets stress correct bucket lubrication, frequent inspection, replacing worn parts and operating efficiency.

3 CHAIN DRIVES—Link-Belt Co., has computed and published in book form a series of tables for calculating center distances and chain lengths of chain drives operating over cut-tooth wheels. This 20-page book is No. 1991.

4 CONVEYORS—Robins Conveying Belt Co. has published a booklet which presents the facilities, operations and products of the company. It illustrates the departments in which the various products are manufactured, such as idlers, conveyor belts, screens and shakeouts, belt conveyors, etc. Descriptions and illustrations of the various products are also included.

5 CRUSHERS—Eagle Crusher Co., Inc., has released a bulletin describing and illustrating jaw crushers, models H, MT, E, T, L, S and SK, mounted on truck, tractor, trailer, portable, roadside or for gravel plant.

6 DIPPERS—American Manganese Steel Division of American Brake Shoe Co. has released a 32-page bulletin, No. 1043-CM, describing and illustrating various steel parts for cement mills, such as dippers, gears and pinions, wheels, rollers and sheaves, conveyor screws and parts, grinding mill liners and screens, chains, sprockets and buckets, pulverizer parts, castings and pumps.

7 DRILLS—Black Drill Co. has published a booklet on "Hardsteel" drills which drill, countersink, counterbore and ream hardened steel without annealing. Instructions for using the drill and a drill chart are also included.

8 DRIVES—Allis-Chalmers Mfg. Co., new 44-page bulletin No. B-6249 describes its complete line of fractional horsepower texrope V-belt drives and sheaves. Amply illustrated with installation photographs, line drawings and selection tables, the bulletin will be of interest to manufacturers and operators of light duty power tools, fans, blowers, pumps, stokers, oil burners, and processing equipment.

9 DRIVES—General Electric Co., new 40-page Bulletin GEA-4025 features the thy-mo-trol, electronic drive for providing and controlling adjustable-voltage power from a-c lines for utilization of d-c motors. The bulletin, well illustrated, explains the drive in considerable detail, describes its functions, and lists its advantages. Typical applications are also listed.

10 DUST COLLECTORS—Pangborn Corp., new bulletin No. 910 describes and illustrates the industrial type "CK" unit dust collectors. Features and construction specifications, together with capacities and dimensions, of the three sizes available are completely covered.

11 FILTERS—The Eimco Corp., new bulletin F-2002, describing and illustrating continuous vacuum filters and dryers, will be of particular interest to chemical and other process industries which have a dewatering or filtering problem. The bulletin contains blueprint diagrams showing relative elevation arrangement of filters and accessories. Illustrations of typical installations are also shown.

12 HARD-FACING—Wall Colmonoy Corp. has released catalog No. 75 describing and illustrating various machinery parts which can be protected by hard-facing alloys, also the different grades of alloys to be used.

13 PUMPS—Chain Belt Co., has issued a new Bulletin No. 433 descriptive of REX speed prime pumps which are made in capacities ranging from 3000 to 125,000 gal. per hour. Complete information concerning the mechanical parts and construction of the pump, how it operates, also specifications and capacity charts to aid in pump selection, are shown.

14 PUMPS—Joshua Hendy Iron Works has released catalog No. 43, describing and illustrating Westco and Pomona pumps. Specifications, performance tables, diagrams and engineering data on the various types of pumps are included.

15 RECONDITIONED MACHINERY—Morse Bros. Machinery Co. has issued bulletin No. 431 describing and illustrating rebuilt and reconditioned mining, ore milling, material handling, power plant, electric and contractors' machinery and equipment.

16 SILO STORAGE—The Nicholson Co., constructors of concrete silos, has brought out an interesting booklet containing blueprints and illustrations of typical installations. Tables showing capacities of circular bins are also shown.

17 SPEED REDUCERS—Stephens-Adamson Mfg. Co., has released a new 8-page catalog No. 643 describing and illustrating single and double reduction type "Saco" speed reducers. Dimensions, horsepowers, speeds, sheave and V-belt data are also included in the catalog.

18 TRUCKS—The Buda Co., has brought out bulletin 1155 containing descriptions and illustrations of the many uses for the "Chore Boy" trucks. Construction features and specifications are also included.

19 TRUCKS—Willamette Hyster Co., has published a series of catalogs describing and illustrating lift trucks of 15,000-, 7500- and 2000-lb. capacities, also the Karry Krane and three different models of straddle trucks of 12,000- and 30,000-lb. capacities.

20 TUBE MILLS—Hardinge Co. has published two new bulletins. No. 18-A describes and illustrates ball tube mills and pebble tube mills, also feeders and compartment mills. Sectional diagrams illustrate the movement of material in the mills. Bulletin No. 35-B describes and illustrates clarifiers and digesters. Cross section diagrams of these units are included in the bulletin.

21 V-BELTS—The B. F. Goodrich Co. has released a 4-page folder on its line of V-belts, featuring information about the wire grommet type of V-belt which is built with exceedingly high tensile strength, and allows a considerable increase in horsepower ratings over the conventional type V-belts.

22 WASHERS—Eagle Iron Works has released a 24-page catalog-bulletin No. 44 describing and illustrating single and double screw washers, log washers, sand tanks, dehydrators, shale removers, and classifiers, motor mounts and drives for the washers. Numerous lists of specifications and engineering drawings are also given.

23 WIRE ROPE—Macwhyte Co., has brought out Catalog G-15 containing 160 pages of helpful information on conservation and care of wire rope.

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ROCK PRODUCTS'
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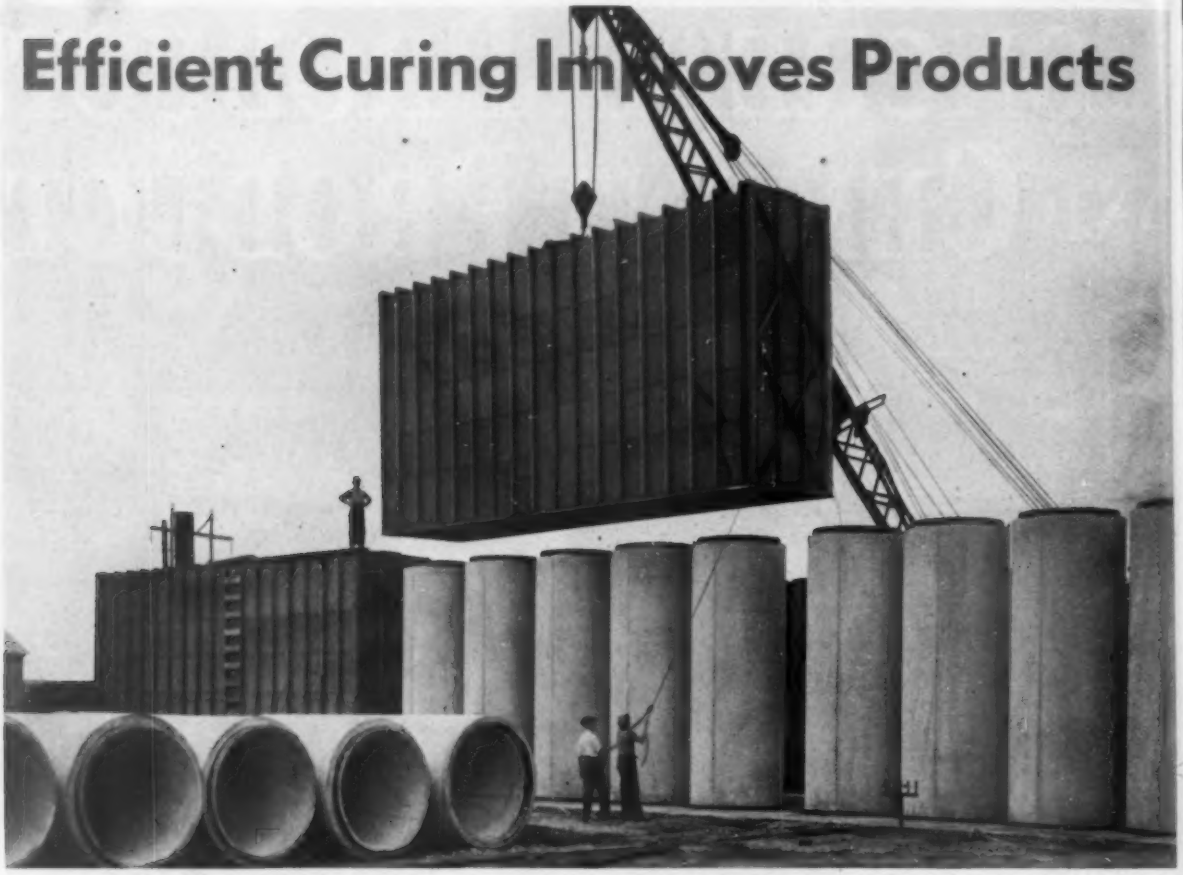
Efficient Curing Improves Products



Curing boxes, made of timber and plywood, 40 ft. in length, 8 ft. in width and 18 ft. high, were used in 1942 to steam cure five 58-in. reinforced concrete pressure pipe 16 ft. in length in one operation for a defense project in Wisconsin

By M. W. LOVING*

WHILE many articles have been written on this subject in the past 40 or more years, it is desirable to review it again to emphasize its importance. This is particularly true in light of the progress that has been made and the care exercised in curing precast concrete products. When inadequately cured, defects frequently develop before the products are sold and they are rejected or, worse still, the inadequate curing may cause failures under normal service conditions. Obviously, all the trouble and expense to which manufacturers have gone to provide adequate curing for their products is based on practical experience and motivated by force of necessity.

Engineers will not infrequently reject precast concrete units, some large and expensive, for minor surface and other defects, including shrinkage cracks. Similar defects in large, built-in-place concrete structures are often caused by inadequate curing, but these structures cannot be rejected; therefore, they are patched or otherwise repaired. Thus there is a practical and economical reason why the concrete products manufacturer, in order to compete with built-in-place structures, must adopt simple but adequate controls, especially for curing, and see that his workmen follow them religiously day in and day out. Experienced manufacturers say this is the only course to follow to assure the desirable end result—that the products will have the maximum strength and density and, more important, a long life expectancy with the minimum of surface and other defects.

My experience for more than 25 years has been with concrete pipe and reinforced concrete pipe used for the construction of sewerage systems, drains, culverts, irrigation systems, and water supply lines, and to a lesser extent with reinforced concrete lighting standards, reinforced concrete cribbing, and other concrete products. Many plants where these products are manufactured in all sections of the United States and Canada have been inspected and manufacturing problems have been discussed with the men in charge. Moreover, it has been necessary to examine many existing pipe lines and other precast concrete structures of all kinds when defects and failures are reported. This has included a number of condition surveys of concrete pipe lines, reinforced concrete lighting standards, and inspections of reinforced concrete cribbing and piling installations.

Curing is just as important as the selection and the use of suitable fine and coarse aggregate, the proper gradation and adequate time of mixing these ingredients with the proper amount of portland cement. In this discussion it is assumed that the precast product is made with the best grade of concrete. Curing is especially

*Consulting engineer.

important for concrete pipe, cribbing and lighting standards as these units are subject to severe service conditions.

Consistency of Concrete

Semi-dry consistencies of concrete are used in manufacturing pipe, block, brick, drain tile, structural tile, silo staves, and other products. Plastic consistencies of concrete are used in manufacturing reinforced concrete cribbing, piles, lighting standards, bridge slabs, reinforced concrete pipe and many other structures. It is desirable, in order to avoid confusion, to discuss separately the curing of products made with semi-dry and plastic concrete mixes.

When semi-dry consistencies of concrete are employed, the molds or forms are immediately stripped and reused. In the case of block, structural tile and other small units, this operation is accomplished at the machine. The units are commonly placed on racks which, when loaded, are transported to the curing room with lift jack trucks. Pipe is transported from the machine to the curing room in molds which are immediately stripped. In many cases reinforced concrete pipe are manufactured this way in diameters ranging from 24 to 60 in. in diameter and weigh from 0.5 to 2.6 tons each.

If the semi-dry concrete mixture is too wet, the unit will slump when the forms are stripped and must be knocked down and the concrete returned to the machine for reuse. This is an expensive operation especially when pipe, for example, is reinforced with steel, as the cage is often ruined when subject to this abuse. This point is mentioned here to emphasize how important it is to employ the correct consistency of concrete.

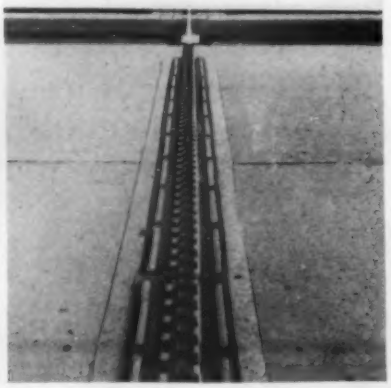
Interior view of curing room of a concrete pipe plant, Toronto, Canada. Pipe are cured by water spray in summer and steam in the winter months

Conversely, if the semi-dry consistency is too dry, the distinct web-like markings on the external surface of the unit will be conspicuous by their absence. This indicates that an insufficient amount of water may have been used to hydrate the cement. If very dry consistencies are employed, curing may not add much to the ultimate strength of the concrete or assure long life expectancy under actual service conditions. Because workmen like to handle products made with dry concrete consistencies, to avoid culls and for ease in stripping the molds or forms, the plant superintendent or foreman must be constantly on the alert to see that web-like markings appear on the surface of each unit. This is mandatory as a basis of acceptance in all A.S.T.M. specifications for concrete pipe, plain and reinforced, ranging in diameters from 4 to 108 in. Here is the clause from the Standard Specifications for Reinforced Concrete Culvert Pipe, A.S.T.M. Designation: C76-41, Section 37 entitled *Rejection:*

"(f) Te complete absence of distinct web-like markings, which is indicative of a possible deficiency of water in the concrete mix, from the external surface of pipe made by any

Left: External surface of these 33-ton reinforced concrete pressure pipe was sprayed with a bituminous compound at Los Angeles in 1936, and when dry the surface was sprayed with whitewash before tipping pipe to horizontal position

Below: Ends of each pipe were fitted with covers and the interior surface of the pipe intermittently sprayed with water for 14 days. Construction history of each pipe is recorded on the blackboard, shown at the right



Left: Precast reinforced concrete sidewalk slabs on Wabash avenue bascule bridge, Chicago, installed in 1930. The photograph was taken on April 13, 1944. Center: Finger casting expansion joint at center of bridge. Right: Precast reinforced concrete bridge slabs on the roadway, between and adjacent to the street car tracks, on the Wabash avenue bridge over Chicago river

process in which the forms are removed immediately after the concrete has been placed."

Plastic Mixtures

Plastic concrete mixtures are used to manufacture reinforced concrete pipe by the cast, vibrocast and centrifugal processes. Lighting standards are made the same way. Cribbing, bridge slabs, piling and other reinforced concrete products are made with concrete of plastic consistency placed by the cast or, preferably, the vibrocast process.

Obviously, there is an abundance of mixing water used to hydrate the cement and a low water-cement ratio is often used so as to obtain maximum strength. Curing is important and necessary for these precast units for the reasons previously mentioned for those made with semi-dry concrete consistencies. This is especially true in hot, dry climates, and some of the examples and typical cases discussed hereinafter demonstrate the need in this direction and the practical benefits resulting from careful curing.

The fundamental need for curing concrete is to prevent evaporation of the water required to hydrate the cement and this is usually accomplished in properly designed curing rooms, curing boxes, and not infrequently the products are covered with canvas, burlap or other covers. Steam curing, water spray or a combination of both are employed universally, although there is at least one case where a manufacturer saw fit to construct large bays where concrete pipe was submerged in water. It is said that this method has been followed to some extent in Australia and elsewhere, but obviously it could not be used in winter during freezing weather and it is questionable if it has any practical advantage over water spray and steam curing, even in warm climates.

Size of curing rooms required to cure concrete pipe, for example, is usually about 20 ft. in width and about 100 ft. in length. One plant in Illinois is equipped with four curing rooms, each 20 x 140 ft., two rooms 20 x 120 ft., and six rooms 20 x 80 ft., all provided with concrete roofs 8 to 10 ft. above the smooth concrete floor. Thus, this plant has about 25,600 sq. ft. of curing space. The pipe is cured with steam in the winter months and water spray in the summer. The reason for this is that the higher temperature of steam curing accelerates the hardening of the concrete in the cold months and in the summer the temperatures are usually above 70 deg. F.—thus water spray has been found adequate to secure the desired results.

Curing Room Design

Curing room design, including dimensions, will depend on daily production and the size and shape of the products to be cured, and that phase of the subject will not be discussed at length here. Some products may require a greater number of smaller rooms so they can be filled and curing started as soon as possible. Most manufacturers endeavor to begin steam or water spray curing for concrete products made with semi-dry concrete consistencies within three hours after the forms are stripped. In hot, dry climates the same rule is followed with concrete units made with plastic concrete mixtures, but obviously in this case water spray or steam curing is started as soon as the forms are removed. To accelerate hardening of the concrete, steam curing is often employed before the forms are removed. It is necessary in all cases to prevent the circulation of dry currents of air in any curing room or box, steaming jacket or covers of any kind, and the inner surface of the curing room and the concrete products should be moist at all times.

The minimum time of curing will depend on climatic conditions. The Standard Specifications for Reinforced Concrete Culvert Pipe, A.S.T.M. Designation: C76-41, Section 16, quoted hereinafter, require a minimum of 24 hours. This formerly was 36 hours. There was a lot of discussion on this point in 1935 when a provision for curing was included in that specification.

Curing

16. Pipe shall be subjected to any one of the methods of curing described in the following paragraphs (a) to (c) or to any other method or combination of methods, approved by the purchaser, that will give satisfactory results:

(a) *Steam Curing.*—Pipe may be placed in a curing chamber, free from outside drafts, where the pipe shall be subjected to the action of thoroughly saturated steam at a temperature between 100 and 130 deg. F. (38 and 54 deg. C.) for a period of not less than 24 hr. or, when necessary, for such additional time as may be needed to enable the pipe to meet the strength requirements. When a curing chamber is not available, pipe may be placed in an enclosure of canvas or other closely woven material and subjected to saturated steam at the temperature and for the time specified above. The enclosure shall be so erected as to allow full circulation of steam around the entire pipe. The interior surfaces of the curing room or canvas jackets and the surfaces of the pipe shall be entirely moist at all times.

(b) *Water Spray Curing.*—Under the conditions of enclosure prescribed in Paragraph (a), pipe may be cured by subjecting it to a continuous or frequently applied fine spray of water in an enclosure maintained at a temperature of not less than 70 deg. F. (21 deg. C.) for a period of not less than 72 hr., or such additional time as may be necessary to meet the strength requirements.

(c) *Saturated Cover Curing.*—The sides and top of each pipe may be covered with heavy burlap or other

(Continued on page 87)

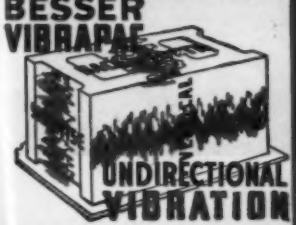
Concrete Masonry Units For Better Equities....

Besser Vibrapac Better Concrete Masonry Units provide the qualities required for Better Equities—

- Durability
- Firesafety
- Termite Protection
- Low Maintenance
- Pleasing Appearance
- Higher Resale Value

Besser Super Automatic Plain Pallet Vibrapac. Capacity 600 8" x 8" x 16" per hour made 3 at a time on one plain pallet. Smaller units made in larger multiples on the same pallets.

BESSER VIBRAPAC



Important Patent Notice

Licensed under the Gelbman basic vibration patents.

Undirectional vibration licensed under Plain patents.

The Vibrapac combines vibration with exclusive patented Besser Plain Pallet principle.

BESSER MANUFACTURING CO.

205 Forty-fourth St. • Alpena, Mich.

Complete Equipment for Concrete Products Plants

THE SAVING IN PALLET COST WILL PAY FOR A BESSER VIBRAPAC PLAIN PALLET STRIPPER

Specialties

MAKE SMOOTH FACED COLORED CONCRETE BLOCK

COLOR in concrete is going to receive a great deal more attention in the post-war market for masonry units than it has in the past. The Cities Fuel & Supply Co., Milwaukee, Wis., has been alert to this demand and for the past two years has been making a very attractive colored concrete unit. It is made in any size required, including specials.

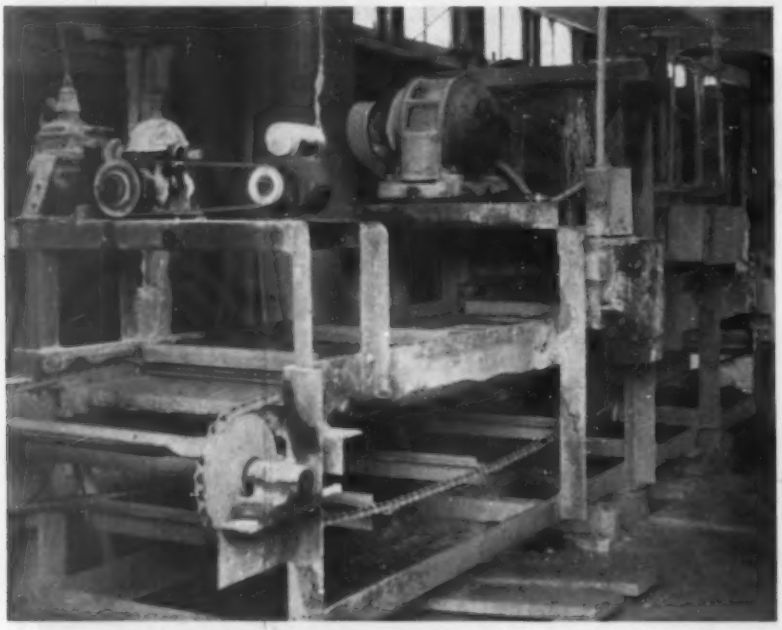
By RALPH S. TORGERSON

There are several distinguishing characteristics of the block made by this company. The color runs through the entire unit, the outside face of the block as it is laid up in the wall is ground smooth, and the color remains bright due to special treatment of the surface.

The block are made on a Besser Vibrapac machine equipped with a pneumatic off-bearer. The mix includes Waylite aggregate, a crushed native stone, a mineral color, portland cement and waterproofing. After curing the blocks are transported in racks to the finishing plant by a lift truck designed by the company. This truck is powered with a 4-cylinder Wisconsin air-cooled gasoline engine.

This building contains equipment for grinding and polishing the colored concrete blocks. The grinding equipment, shown in one of the illustrations, comprises a chain and sprocket-driven roller conveyor operated by ¼-hp. electric motor which draws the rough faced colored concrete block under two carborundum impregnated rolls that grind off the surface and expose the crushed stone

(Continued on page 86)

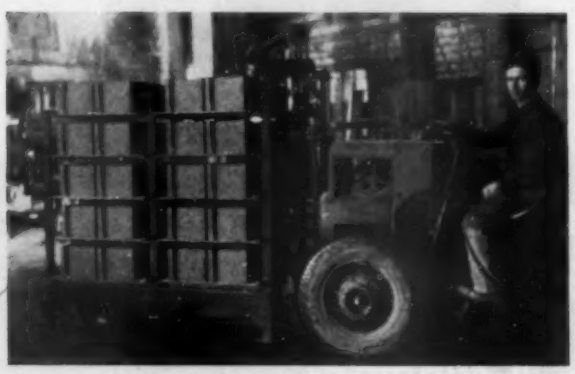


Polishing and grinding machine comprises conveyor to draw colored block under carborundum impregnated rolls, at the back of the machine

Left: Vibrating type block machine with pneumatic off-bearer

Below: Special lift truck developed by company powered with a gasoline engine

Revolving disc type grinder for smaller sizes



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In hundreds of products plants dotted throughout the nation, Stearns material handling, mixing and block making equipment is waging a successful battle to keep operating costs *down*. From storage bins to curing rooms Stearns equipment is reducing man power and waste motion, cutting maintenance costs, *producing more blocks per man per hour than other equipment of comparable price.*

And in these hectic war years when Stearns machines are driven to their productive limits, our experienced dealer organization, whose mature judgments are of inestimable value, are available to every producer of concrete products.

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Stearns can and is supplying concrete products plant equipment for *necessary* construction work: Vibration and tamp type block and brick machines. . . . Mixers. . . . Skip Loaders.

What is your pressing need? Permit us to assist you with proper priority procedure.

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Designers and manufacturers of vibration and tamp type block and brick machines. . . . Mixers. . . . . Skip Loaders. **Descriptive literature on request.**
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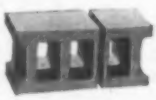
Performance Speaks louder than Words. Ask any STEARNS owner

FASTER CUTTING
...with
Clipper Masonry Saws

Your Special Size and Shape Brick or Concrete Block can now be "Tailor Made" at a moment's notice!

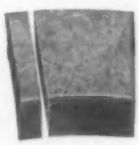
The new Clipper Multiple Cutting Principle makes possible faster cutting of every masonry material regardless of hardness.

Here are a few typical examples of the speed and accuracy with which concrete products and fire brick can be cut.



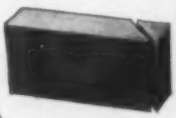
This concrete block, converted into a special size, was cut completely in two in 19 seconds.

One of the many intricate cuts performed on first quality clay brick for heat treating furnaces, —made in 8 sec.



Rotary Kiln Blocks, cut to size for "key" bricks in rotary kilns, require only 10 sec. for completion of cut.

Basic refractories for steel furnaces or cement kilns must be accurately installed. This magnisite brick was cut in 12 seconds!



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THE Clipper MANUFACTURING COMPANY

4005 CHOUTEAU

ST. LOUIS, MISSOURI

aggregate. The grinding rolls are driven by a 15-hp. electric motor through V-belt drive.

Both rough grinding and polishing is done on the roller conveyor. One of the rollers is impregnated with coarse carborundum, and the other has a finer, dense surface for polishing.

Special block are ground and polished on a disc about 4 ft. in diameter revolving in a horizontal plane through motor gears and bearing in the base, shown in the illustration. About four block can be polished at the same time.

When the block have been polished smooth, they are washed off and after drying are given a surface treatment with a water-proofing material which brings out all the bright colors, and it penetrates so deeply that it is believed the color will be fixed for many years to come.

Test Concrete "Plank"

LOAD-BEARING TESTS were made of "concrete plank" manufactured by the Cities Fuel and Supply Co., West Allis, Wis., at a demonstration conducted by Professor Olson of Marquette University Laboratory for Testing Materials on April 15.

Architects, builders, and engineers and the press from the Milwaukee area were invited to attend the demonstration. The plank, which were described in ROCK PRODUCTS, December, 1943, issue, page 78, were made up for the test into a slab 15 ft. 6 in. long with a clear span of 14 ft. As previously described, the plank is comprised of concrete masonry units butted together end-to-end. The ends of the units are dipped in a rich portland cement mortar before they are drawn together under tension.

(Continued on page 105)

Two views showing "concrete plank" being subjected to a load test of 273 lbs. per sq. ft.

Curing Concrete Products Efficiently

(Continued from page 82)

suitable material, saturated with water before applying and kept saturated with water at a temperature of not less than 70 deg. F. (21 deg. C.) for 72 hr., or such additional time as may be necessary to meet the strength requirements. The ends of the pipe shall be so enclosed as to prevent the free circulation of air through or around the pipe. If the temperature of the water is less than 70 deg. F. (21 deg. C.), the curing period shall be increased as may be necessary to meet the strength requirements.

The engineer members of Committee C-13, A.S.T.M., insisted that a provision for curing be included in the specifications but the subject is not mentioned in the A.S.T.M. Specifications for Concrete Sewer Pipe and Reinforced Concrete Sewer Pipe. Those members of the Committee who are experienced manufacturers of concrete pipe pointed out that when high early strength cements are used, 24 hours is adequate. Moreover, in very cold climates many of the manufacturers heat the fine and coarse aggregate and the mixing water, and when standard portland cement is used, hardening of the concrete is accelerated. In sub-freezing temperatures, pipe and other products are steam cured for at least 72 hours. Many do the same thing in warmer climates to obtain maximum strength and density of the product.

Concrete products should, under no circumstances, be removed from a hot curing room into a cold atmosphere as a sudden change will usually cause cracking and other defects. It is best to let the temperature lower gradually in the final stages of steam curing to avoid this hazard. When the concrete products that have been steam cured for 48 or 72 hours are placed in the storage yard in subfreezing temperatures, hardening of the concrete is arrested. When temperatures rise the hardening is resumed. In one case in Canada, reinforced concrete pipe was yarded for more than three months before the temperature rose and the hardening was resumed; the pipe then met the strength test.

Curing Lighting Standards

Curing reinforced concrete lighting standards is highly important. A lot of trouble has been experienced in the past when curing and other manufacturing problems were neglected. In 1926 the Commissioner of Gas and Electricity of a large city asked me to function as a referee between his department and three manufacturers of concrete lighting standards because many of these units that had been in service a comparatively short length of time had failed. The manufacturers blamed each other and the design of the standard prepared by the city officials, while the latter blamed the manufacturers for the trouble.

With one assistant, more than 1000 standards were carefully examined for surface and other structural defects in all parts of this city; also in another large city where reinforced concrete lighting standards up to 57 ft. in length had been in service many years. In both cases the standards were subject to very severe temperature changes along the shores of one of the Great Lakes. The standards had been made by the cast and centrifugal processes by men who had very little technical knowledge of concrete. Many of the standards were of an artistic and frail design, others of heavy design. Shrinkage cracks from hair to actual failures were the rule rather than the exception. Some of the flimsy and what were considered inadequate designs had been in service more than 30 years and were in excellent condition. Standards of the same design in service only five years had failed in nearby locations and had to be replaced. Moreover, heavily designed standards were severely cracked in some localities and in excellent condition nearby. It was our considered opinion in 1926 that adequate curing and careful

The MULTIPLEX Combination

Beauty in Block
Low Production Cost
Simple Operation

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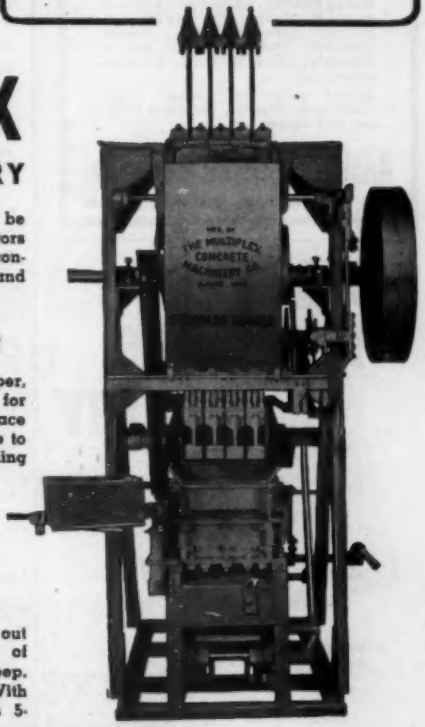
CONCRETE MACHINERY

With MULTIPLEX machinery you can be sure of getting the three important factors of a profitable business—high-quality concrete products, low production costs and simple, efficient plant operation.

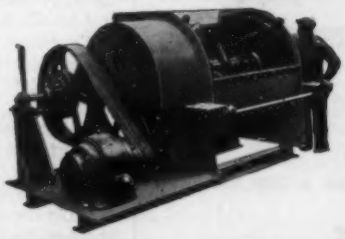
MULTIPLEX STANDARD TAMPER

The MULTIPLEX 8-bar Standard Tamper, shown here, is a Universal machine, for making both plain and stripper, or face blocks, on one base. Produces from three to four 8 x 8 x 16 in. units a minute. Time-feeding while tamping and hopper agitation make better units. Strike-off hopper assures a smooth top. Has rugged, all-steel welded frame and reinforced moldbox.



MULTIPLEX SUPER-TAMPER

A profit-and-production headliner—turns out 4 to 6 units per minute at low cost of production and with minimum of upkeep. Runs quietly with little vibration. With position-timed feeding and stripping, its 5-point clutches assure quick action. No waiting between operations—higher unit rate of production at lower unit costs.



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Reverse screw-type gives fast and thorough mixing of every batch, on a lower cost basis. Sizes 5 to 60 cu. ft. and larger. Side, bottom or end discharge.

The MULTIPLEX line includes Power Tampers, Power Presses, Hand Machines, Super Tampers, Mixers, Block Cars, and Racks. Complete plant installation — parts — repairs. Write for the MULTIPLEX catalog.

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"ANCHOR"
Complete
EQUIPMENT AND ENGINEERING SERVICE

Equipment for all phases of manufacturing concrete cinder block and other lightweight aggregate units. Our engineering service for new plants and modernizing old ones will help you operate more economically.

Hobbs block machines, Anchor tampers, Anchor Jr. strippers, Stearns power strippers, Stearns Joltcrete, Stearns mixers, pallets, Straublex Oscillating attachments, etc.

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Continuous and Batch

BLOCK MACHINES
Vibra-Press and Strippers

ELEVATING EQUIPMENT
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TRANSMISSION MACHINERY
Pulleys and Couplings

PALLETS
Pressed Steel or Cast Iron

TAMPERS

THE KENT MACHINE CO.
CUYAHOGA FALLS • OHIO

Curing Concrete Products

(Continued from page 87)

handling of standards would solve most of this trouble.

The manufacturers were advised to employ technical superintendents at once. My assistant was placed in charge of one of these large plants, which position he occupies at the present date. He told me in April, 1944, that the trouble experienced in 1926 had been minimized to such an extent by careful and constant care in handling and curing reinforced concrete lighting standards that shrinkage cracks and other surface defects were very rare. He had recently inspected an installation of 4800 standards that were carefully cured and handled and were installed in the same area in 1927. They are in excellent structural condition in 1944. High early strength cements were used so that the expensive molds can be removed within six hours and reused. The units, some of which are 32 ft. in length, are steam cured in the molds for five hours and from 48 to 72 hours by steam or water spray after the molds are removed. Under no circumstances are the units subject to a sudden and wide variation in temperature.

Curing Mortar Joints for Pipe

Curing cement mortar joints for pipe lines is a very important requirement. If green mortar joints are exposed to the direct rays of hot sunshine or currents of dry air, shrinkage cracks will usually develop, thus permitting leakage and infiltration of water or sewage when the pipe lines are placed in service. It is necessary, therefore, to cover all freshly made cement mortar joints with damp sand, soil, wet burlap or similar covers. In the construction of concrete irrigation pipe lines, which operate under low hydrostatic pressure, experienced manufacturers are as careful in making and curing portland cement mortar joints as they are in curing the concrete irrigation pipe, because in California most of the pipe manufacturers install the pipe lines under contract with land owners and assume responsibility for maintenance against leakage and other defects. So experience has taught them the importance of curing in all its phases.

Excessive infiltration in clay pipe sewers is often blamed on the cement mortar joint and engineers have, in some cases, substituted other types of jointing materials which have limited advantages for this service. Adequate curing of the cement mortar joint would have avoided most of the trouble because the cement joint is the best to use for concrete pipe lines, clay pipe lines and—hold on to your chair—cement mortar is used extensively for joints in small cast iron water and gas mains. Cement mortar joints for cast iron water mains were used in Los Angeles, Calif., as early as 1894, and when a 30-in. line was exposed in 1933 the joints were found to be in excellent condition. In Detroit, Mich., up to 1930 more than 600,000 cement joints were in service in cast iron gas mains operating under pressures of 5 p.s.i or less, and it is said that the service records in that city indicate that failures of cement joints were less than one in 7000, whereas failures in lead joints were about one in 1800.

Tests of Large Pipe

Curing large reinforced concrete pipe was a mandatory provision at Los Angeles, Calif., in 1936. Installed as distribution mains for water from the Colorado River Aqueduct, these pipe ranged in diameter up to 12 ft. 8 in., shell thickness 13 in., and 12 ft. in length. The weight of each unit was 43 tons and the contract price installed was about $500. As soon as the forms were removed with a gantry crane, the external surface of each pipe was sprayed with a bituminous compound—to prevent the evaporation of mixing water required to hydrate the cement. Just as soon as this *black compound* dried, which wasn't long in that hot, dry climate, it was sprayed with *whitewash* before the units were tipped to the horizontal position. The object here was to avoid excessive absorption of heat from the sun which is maximum with a black and minimum with a white surface. (That's why the Arabs wear white, flowing garments.) The primary object of this was to minimize the difference in temperature between the inner and outer surface of the pipe shell to avoid temperature stresses that cause cracking.

Each pipe was fitted with large circular discs made of plywood and access provided with doors as shown in the accompanying pictures. The inner surface of each pipe was cured with water spray, applied intermittently for 14 days. On a blackboard shown at the right of the accompanying illustration is depicted the history of each pipe, including date of fabrication, operating head for which the steel reinforcement was designed, etc. An inspector for the Metropolitan Water District of Southern California was on hand to see that all provisions of the specifications were fully complied with day in and day out.

Curing boxes, also made of ⅜-in. plywood, were used to cure five 58-in. reinforced concrete pressure pipe which are 16 ft. in length, used for a defense project in Wisconsin in 1942. From the accompanying picture it will be seen that these boxes are handled by a crane and they are 40 ft. in length, 8 ft. in width and 18 ft. high. The steam was introduced into each pipe through inlet nozzles in the concrete floor. The pipe were cured for 12 hours in the forms and from 12 to 24 hours after the removal of the forms. After the pipe were re-

moved from the base rings, they were cured for six days by intermittent sprinkling with water during daylight hours.

Lightweight Bridge Slabs

Precast, lightweight concrete bridge slabs were manufactured and installed on the Wabash Avenue, bascule bridge over the Chicago River in 1930. The American Institute of Steel Construction presented its annual Award of Merit to the City Engineer and Bridge Department of the City of Chicago for this improvement as the most beautiful steel bridge, Class A, constructed in the calendar year 1930. The slabs were designed and their manufacture supervised by the Bridge Engineering Department of the City of Chicago. The 224 roadway slabs are 5¾ in. thick and range in dimension from a maximum of 11 ft. 11¾ in. by 9 ft. 7½ in. to a minimum of 8 ft. 6¼ in. by 2 ft. 7-9/16 in. The larger slabs were used in the roadway proper and the smaller ones between and adjacent to street car tracks. Sixty sidewalk slabs were required and range in dimension from 11 ft. 6⅛ in. by 9 ft. 2-9/16 in. to a minimum of 11 ft. 6⅛ in. by 6 ft. 2½ in. The thickness of all sidewalk slabs is 2½ in.

The roadway slabs were reinforced with steel bars, top and bottom, accurately placed and secured with stirrups. The sidewalk slabs were reinforced with two layers of welded wire fabric securely held 1 in. apart; thus the cover over the steel reinforcement, top and bottom, is slightly less than ¾ in. The sidewalk slabs were made of a concrete mixture of 1: 1½:2½—high early strength cement, sand and coarse, lightweight aggregate, which weighed 117 lb. per cu. ft. The roadway slabs were provided with a concrete wearing surface 1¼ in. in thickness made with a concrete mixture of 1:1:2—high early strength cement, fine granite screenings and granite chips up to ½ in., weighing 160 lb. per cu. ft. The lower 4½ in. of the roadway slabs was made of the same mixture as the sidewalk slabs. The mixing water consisted of 4½ gal. per cu. ft. of concrete, which was carefully placed by the vibrocast process. The slabs were carefully cured with steam for 8 hours and kept constantly moist with water spray for more than 14 days.

The accompanying illustrations were taken by this writer on April 13, 1944, by special permission and in the presence of the U. S. Coast Guard patrol. Practically all slabs are in excellent condition, free from blemishes of any kind, including shrinkage cracks. There are a few spots on several of the slabs where the concrete has been chipped by rough handling, probably during erection, but all in all they are in excellent structural condition. Their performance, in our judgment, is an outstanding example and reward for precise care in design and manufacture, including accurate placement of steel reinforcement and especially the use of dense, impermeable concrete and adequate curing.

Sell Products Concern

Van Der Vaart Brick and Building Supply Co., Sheboygan, Wis., has purchased the Wiegand Concrete Products Co., Green Bay, Wis., according to Fred Wiegand. The new owners also operate the Wisconsin Concrete Pipe and Culvert Co. Fred Wiegand and his organization will remain with the new company. In addition to concrete products manufacture, the company will now manufacture sewer and culvert pipe. Machinery for this purpose will soon be installed, according to a local report.

Construct Block Plant

Cement Products Co., Cumberland, Md., plans to erect a concrete block manufacturing plant on a site along Mt. Savage road opposite Gaither Quarry. The present plant on Henderson avenue will be continued, according to President William P. Roeder.

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Any size or style screen, in thickness of steel wanted with any size perforation desired.
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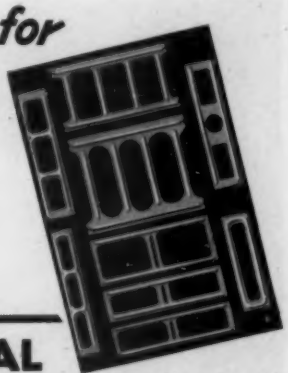

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The COMMERCIAL SHEARING & STAMPING COMPANY
YOUNGSTOWN, OHIO.

Fertilizer Resources

(Continued from page 60)

make it acid, there is a large capacity to hold other positive ions that can be fertility, when we once decide to apply it. This fact offers hope for long continued use if our management puts the fertility into those soils. This acidity is also an agent to break down rock products applied, as soil treatment and mobilize their fertility for plant use.

Fertility Reserve in Some of Our Soils

Another glimpse at the diagrammatic sketch of Fig. 1 suggests that the clay and the silt minerals undergo interactions of exchange, much in the same manner as is true for the clay and the plant root. This is one of the fundamental facts pointing to the possible use of the reserve fertility in the mineral crystal of the soil. The clay plays an important part as intermediate agent between the plant root and the mineral crystal. The plant can get nutrients by direct root contact with the mineral crystal, but plant growth by this means has been found experimentally to be at a lower rate than when an acid clay serves as interceder between the plant and the mineral crystal. We can visualize the clay (a) as an acceptor of hydrogen from the plant root, (b) as a conveyor of it to the mineral in concentrations of significance for releasing the nutrients in the mineral by this acid effect, and then (c) as the deliverer in return to the plant of the nutrient set free from the mineral. The acidity in the clay is in reality of service rather than of detriment. Because the clay supply of fertility is rapidly exhausted, it is in the stock of minerals, particularly those of silt-size particles in the soil, that the reserve fertility and future productivity of our soils must be found.

A careful study of the silt minerals of some different soils by Dr. E. R. Graham of the Department of Soils of the College of Agriculture of the University of Missouri, has given an interesting inventory of them with reference to this part of the soil body. As a soil is weathered more, or as it is older in its geological experience, these reserve minerals are mainly those resistant to weathering, such as quartz, for example. Unfortunately, quartz contains no plant nutrients. The windblown soils of the Missouri and Mississippi river bluffs are more youthful as they are nearer to the stream, and more weathered with greater distance from it. Accordingly, in going away from the stream there is more quartz and there is also less of other minerals, or those which carry the plant nutrients. Even these other minerals are more weathered and deliver less, for example, of calcium, which is a much needed nutrient in most soils.

Silt Minerals Represent Reserve Fertility

With more rainfall and higher temperatures as one goes from West to East and North to South in the United States, respectively, this reserve of silt is lower in its supply of fertility, or is higher in quartz. With less rainfall and cooler climates the soils are usually higher in minerals other than quartz, and in nutrients like calcium for example. Mr. Vanderford's studies of six samples of the same soil type along the Missouri and Mississippi rivers extending from Sioux City, Iowa, to Mississippi, contained 53, 68, 71, 73, 79 and 80 percent of quartz and .90, .60, .44, .42 and .30 percent, respectively, of calcium in the silt in

Quartz and Calcium in typical Soils	Quartz %	Other than quartz %	Calcium %
Barnes silt loam, South Dakota	70	30	.90
Clarion silt loam, Iowa	66	34	.70
Cisne silt loam, southern Illinois	73.2	26.8	.40
Lufkin silt loam, Mississippi	87.8	12.2	.25

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BUCKETS
Williams Buckets have been famous for their many fine mechanical details for nearly 40 years. Since 1931, Williams Buckets have been built by Wellman.
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going from low to higher rainfall and to higher temperatures.

According to the data, these soils carry a calcium reserve—and possibly a corresponding reserve of other nutrients—in the silt fraction, or the rock fraction, that varies widely. Our less weathered soils bid fair to carry us into the future, because they have a fertility reserve in these minerals. This reserve also represents more productivity at the present time.

The clay and the organic matter are the agencies that are active in moving soil fertility from the mineral reserve in the rock residues of the soil to the crop roots. The fertility supply on the clay alone will serve but a few crops. The supply in the organic matter is also only temporal. It is in the rock and better fragments left as silt and sand sizes that the long-time, and better soil productivity resides. It is moved from these to the plant through the activity of the colloidal clay and the humus.

Water-insoluble materials like limestone or any rock products applied to the soil as fertilizer are also reserve materials handled in the same process. The hydrogen ion coming from the plant is passed to the clay and from it to the rock mineral to break it down. Its nutrient contents are taken by the clay and passed back to the plant. Lime rock applied to soil does modify the acidity some, but is really a fertilizer because of acidity.

Here in this soil mechanism is a case of truly "passing the ammunition" when soil fertility in the rock residues is passed by the colloid to the root and is being fabricated into the food to win the war. It is this passing of the ammunition by which we manage our soils wisely for maximum crop production with maximum soil and soil fertility conservation. Our understanding of how the rocks of the soil can feed the crops gives us the fundamentals in plant nutrition on which efficient agriculture and food production must really rest.

Award Large Contract

BUFFALO GRAVEL CORPORATION, Buffalo, N. Y., has been awarded a contract by the War Department for the construction of railroads, roads, earth fill track barricades, drainage facilities and incidental work for a 200-car storage yard in Delaware. The estimated amount of the contract is $883,375.

Pavement Yardage

AWARDS of concrete pavement for March, 1944, have been announced by the Portland Cement Association as follows:

Square Yards Awarded During Mar., 1944	
Roads	238,083
Streets and Alleys	325,457
Airports	2,752,987
Total	3,316,527

Eagle "Swintek" Dredge Ladders

LOWER PRODUCTION COSTS *by*

1. *Accelerating output.*
2. *Increasing logical working depth.*
3. *Allowing for hard strata dredging.*
4. *Cutting maintenance.*
5. *Reducing clogging.*

Users of "Swintek" Screen Nozzle Ladders report production increases of up to 400% from their dredges and as little as 6 hours lost time due to clogging in a whole year's operation.

Today, with operating labor at a premium, "Swintek" Ladders are paying double dividends by insuring full shift operation every day by allowing for deeper dredging and by making profitable the working of hard-packed strata unworkable with ordinary suction dredges.

Let us recommend the proper "Swintek" Ladder for your dredge and tell you more of how others are increasing production and profits with this specialized Eagle equipment.

EAGLE IRON WORKS
137 Holcomb Avenue
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Eagle Screw Washers • Log Washers • Dehydrators Classifiers • Sand Tanks

30 to 180 tons per hour capacity. Insure premium washed sand and gravel at lowest costs per yard.
The Standard Single Screw Washer pictured is made in five sizes with 15, 18, 20, 22 and 24 inch screws; 35 to 100 tons per hour capacity. Many other models available.

EAGLE *Specialized Sand and Gravel Equipment*
"SWINTEK" DREDGE LADDERS — SCREW WASHERS
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CLASSIFIERS — REVOLVING SCREENS

EAGLE IRON WORKS
DES MOINES, IOWA

"SERVING INDUSTRY FOR OVER SEVENTY YEARS"

Mica in the War

(Continued from page 50)

these bodies does not imply the presence of strategic mica. Large areas exist that contain pegmatites that hold no appreciable amount of strategic mica.

Phlogopite mica, also commonly known as amber or magnesia mica, is second in importance to muscovite. This type of mica has not been found in commercial quantities in the United States, although small deposits exist in some areas.

Phlogopite occurs in monoclinic crystals which usually are six-sided prisms having irregular and tapering sides. The crystals vary in size from minute particles up to 4 feet in diameter. Its hardness ranges from 2.5 to 3.0, while the specific gravity varies from 2.8 to 3.0.

Thin sheets or laminae are transparent to translucent, usually display an amber color and appear to be as flexible and elastic as muscovite. Unlike muscovite, however, it alters readily, losing its elasticity and assuming a highly pearl-like luster.

The mineral phlogopite is rather scarce although it may be quite abundant in regions of contact metamorphism. However, there are but few areas in the world that contain commercial deposits, and these are in Canada, Madagascar, and Russia.

Phlogopite commonly occurs as crystals and sheets disseminated through metamorphosed rock, usually limestone. These deposits were formed similar to those containing muscovite except that the pegmatitic solutions were injected into the limestone.

Distribution

The principal domestic mica producing areas in order of importance are: the Southeastern, comprising the States of Virginia, the Carolinas, Georgia and Alabama; New England; the Black Hills of South Dakota; New Mexico; followed by smaller areas in Maine, Connecticut, Colorado, and Idaho.

In order of importance by states, North Carolina ranks first, followed by New Hampshire, Connecticut, South Dakota, and Georgia. Production is just getting under way in Maine, Massachusetts, Virginia, South Carolina, Alabama, New Mexico, Wyoming, Colorado, and Idaho.

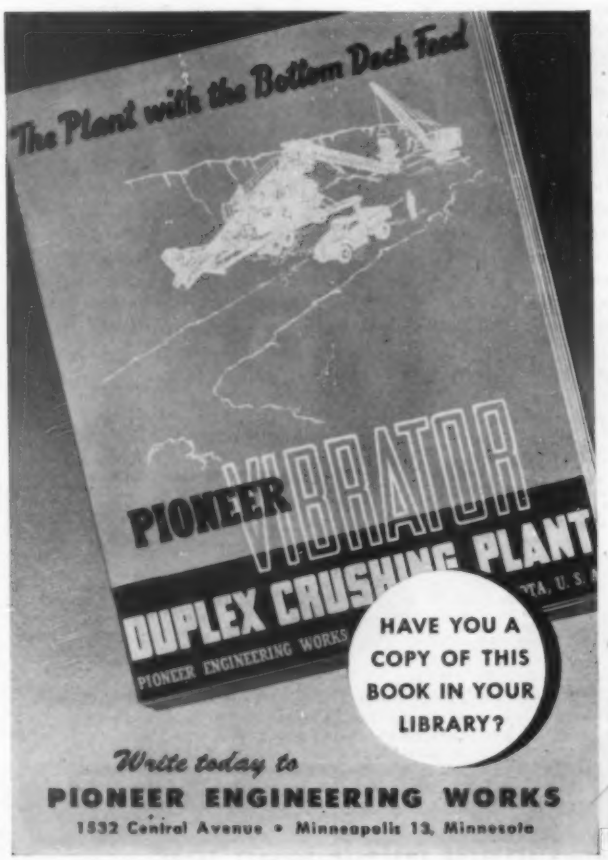
Mica mining first began in 1803 in the Ruggles Mine in Grafton County, N. H., the product being used exclusively for stove windows. This mine is still operating and is the second largest producer in New England. Mining in North Carolina, Virginia, and Georgia began shortly after the civil war.

The principal foreign deposits are in India, Madagascar, Russia, Canada, South America and Africa. Previous to World War II, we depended principally upon imports from India. This country has excellent deposits which combined with exceedingly cheap labor make a product such that our domestic mica cannot compete with. Due to the Pacific war, our imports have been cut to a minimum. This compelled our government to inaugurate measures that would increase our domestic output as well as that of our Latin American neighbors to the south.

Prospecting and Development

In hilly and mountainous localities, the mica-bearing pegmatite dikes are usually exposed so that little difficulty is experienced locating them. In rolling or flat terrain, however, outcrops are uncommon owing to the heavy overburden. Agricultural operations, and the sinking of water wells are often responsible for the discovery of many deposits.

In soft material, pits and trenches can easily be dug where mica is most plentiful in the soil in order to locate the dike. After the dike is found, additional pits and trenches are excavated both along and across the strike so as to determine the character and extent of the deposit. The trenches are usually carried from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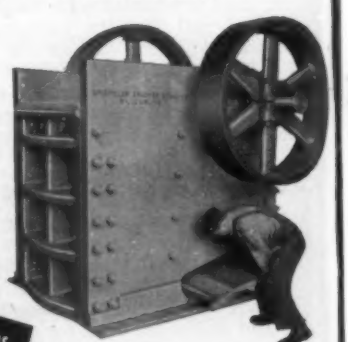
150 TO 200 TONS PER HOUR, CRUSHING HARD ROCK

Steam Shovel sizes to 5" to 6" minus in one-operation

These heavy plate and cast steel constructed roller bearing JAW CRUSHERS have tremendous crushing power. Built to take it for continuous operation with minimum maintenance. Size 25x42.



The complete weight of above JAW CRUSHER is 54,200 lbs.

Mfgrs. of Double Roll Crushers and Hammer Crushers for Secondary Crushing requirements.

BULLETIN MAILED ON REQUEST.

GRUENDLER
CRUSHER and PULVERIZER CO.
2915-17 North Market St., ST. LOUIS (6), MO.

wall to wall of the dike and at right angles to the strike. Pits can be placed where the showing of mica looks most promising.

In mountainous country, it may be necessary to sink a shaft or drive an adit in order to determine the character and extent of the dike. Very often in performing this work, the operator may recover sufficient mica to cover this cost of development.

After the dike has been exposed and representative samples of the mica obtained, they should be submitted to a party competent to pass upon its commercial value. Very often an operator will discover to his sorrow that his mica is of little value.

Mining Methods

Owing to the irregular structure of pegmatites, mining naturally has been conducted with few exceptions on a small scale. In the past, much of this work was done with only hand tools and at shallow depths. Only a few of the larger mines had proper mining equipment. Today, however, suitable equipment is made available by Colonial Mica Corporation to operators of large and small mines.

The character, type, and location of the pegmatite usually determines the method of mining. Shafts may be either vertical or inclined. Due to the irregularities of the deposit, systematic underground stoping is generally impossible. The position of the mica in the dike is first determined, and then simple brest or overhand stopes are driven along this avenue. Stulls and posts are set where needed to hold the walls and roof.

Need Experienced Drill Operators

An experienced drill operator is essential for maximum recovery of the mica. He must know just where and at what angle the holes should be placed so as not to injure the mica crystals both in the drilling as well as in the blasting. Forty per cent dynamite is generally used in the firing charge. After a round of holes has been fired, the mica books are hand picked from the pile of broken rock, placed in the jute bags, taken to the surface and sent to the trimming shed. If feldspar is also recovered all the material may be hoisted to the surface after first removing the larger mica crystals.

A small quantity of strategic mica is recovered as a by-product in feldspar mining. Generally feldspar is recovered by open pit mining, although there are a few large underground mines. In feldspar mining, the ore is cobbed, the mica thrown aside, and the spar loaded into trucks or cars for transporting to the storage bins. The mica is afterwards sorted, placed in jute bags and sent to the mica house.

(To be continued)

Extend Mica Bonus

To SPUR PROSPECTORS in the search for suitable mica, the Colonial Mica Corporation, New York, N. Y., federal buying agency, has offered to pay $5 a pound for acceptable sheet mica, trimmed and prepared for shipment. The offer is good until December 31, 1944. In addition, a production bonus of $1 per pound is guaranteed for the period ending June 30, 1944.

Ohio Ups Agstone Sales

AGRICULTURAL lime and limestone sales in Ohio jumped from 1,420,059 tons in 1942 to 1,520,646 tons in 1943, according to a recent report of Earl Jones, Extension Agronomist for Ohio.

Mica Merger

AMIC MICA MINES stockholders have voted to consolidate with two other operating companies as the Mica Company of Canada, Norman Vincent is president. Production is coming from the Eau Claire area near Mattawa and from the Saguenay area east of Quebec. The processing plant at Hull, Quebec, Canada, is being enlarged.

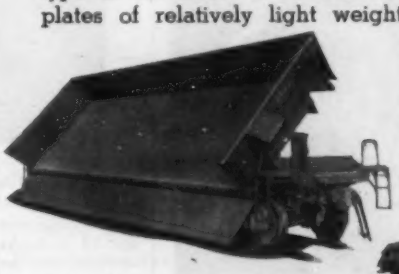
★ ★ ★ ★ ★

Steelcar

ROLLING TRUNNION AUTOMATIC

AIR DUMP CAR

The stripping of overburden and the handling of ore in open-cut iron mining fields require cars of unusually rugged construction. Here, too, special features of design, such as high strength steels, anti-friction precision type journal bearings, the use of rubber at certain points to cushion the floor structure against heavy loading impacts, etc., are frequently desirable to insure low cost operation. The so-called sandwich type of car floor—a combination of top and bottom steel plates of relatively light weight with hardwood filler of suitable thickness between —while available in some Pressed Steel designs, has been largely discarded in favor of a heavy, all-steel, single plate floor.



You will find complete information on these and other types of Pressed Steel designed Air Dump Cars in our new Bulletin 72-C. Would you like a copy?

PRESSED STEEL CAR COMPANY, INC.
INDUSTRIAL DIVISION
PITTSBURGH, PA.

Dust Control

(Continued from page 74)

scroll and out through a pipe discharge in the manner of an ordinary fan. In Fig. 27, the dust is shown as passing into a hopper below the collector along with a portion of the air which, after releasing the dust, reenters the collector thereby forming a circulating system. This is usually termed the secondary air stream. The unit described is the simplest and generally the least efficient of this make. A later design provides a paper or viscous filter in the side of the dust hopper through which the air from the discharge can pass for final cleaning before being released to atmosphere or returned to the room in which the collector is located. The latter is often important from the viewpoint of fuel economy, particularly if a large volume of air is being handled through the collector.

In another design the secondary air passes through a cyclone, the discharge from which returns to the suction inlet of the rotary concentrator somewhat similar to the arrangement shown in Fig. 26.

The above types separate the dust in dry form. When it is not objectionable to collect the dust as a sludge, water sprays are sometimes installed at the suction side of the collector. This produces a film of water on all of the wearing and impinging surfaces, which improves the collection efficiency particularly on the finer sized particles, and to a great extent reduces erosion of abrasive dust. The wetting of some dusts, however, introduces serious corrosion problems which should be carefully considered.

Install Water Spray in Some Special Cases

The water requirements range from about one-third to one gallon per minute per 1000 c.f.m. of gas. This type collector operates at about 350 r.p.m. for the largest size to 3500 r.p.m. for the smallest size. The power requirements are about 1 to 2 hp. per 1000 c.f.m. at 3-in. w.g. This is an overall resistance figure for the complete dust collecting system when using the rotating type collector and should not be confused with the resistance across a collector only, which often is about 3-in. w.g. for many other types of collectors.

The collector shown in Fig. 28 was designed primarily for stoker fired boilers. It was not intended to be as efficient as the cloth filters, or high efficiency cyclones, but has a definite application in steam generating plants. The operation is simple. In effect it is a paddle wheel fan, the gas entering the center suction inlet and a portion of the concentrated dust skimmed off and separated in an auxiliary high efficiency cyclone, the discharge from which returns to the rotary concentrator thereby forming a secondary circulating gas stream.

The advantages of the rotary type collector are:

1. Minimum space requirements.
2. Low power cost.
3. Often low initial cost.
4. In several types, the auxiliary collector can be located some distance from the concentrator, often at a point where the dust can be dumped directly in buggies or returned to the process system.
5. Can handle gas up to 700°F. if bearings are water-cooled.

The disadvantages are:

1. Erosion if handling abrasive dust.
2. The total efficiency cannot be higher than the concentrating efficiency, times the separating efficiency in the auxiliary collecting unit.

SODA ASH
FLOWS EASILY NOW!

● Midwestern cement plant had difficulty keeping free flow of soda ash from bins—until it installed "Branford" Pneumatic Vibrators. Installation view below. There are six "Branfords" in this plant.

No
● ARCHING
● HANGING-UP

BRANFORD
PNEUMATIC
VIBRATORS

● Keep material handling equipment operating at peak capacities and labor costs down to a minimum by using "BRANFORD" Pneumatic Vibrators on Hoppers, Bins, Chutes, Screens, Concrete Buckets, etc.

Economical in operation and maintenance.
Flow of material regulated by air control valve.
Hundreds in successful use.

Write us on your problem.

NEW HAVEN VIBRATOR CO.
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Use PERFORATED PLATE
For More EFFICIENT SCREENING

The natural travel tendency of material on a sloping surface is to travel on a straight line. This results in inefficient screening.

This efficiency loss can be effectively counteracted through the use of perforated plate with either staggered perforations or corrugations, or both.

However special the handling of your particular product may seem at first glance, you'll find an efficient solution at Hendrick's.

Competent and unbiased counsel is available to you.

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SALES OFFICES IN PRINCIPAL CITIES
PLEASE CONSULT TELEPHONE DIRECTORY

Makers of Elevator Buckets of all types. Mitco Open Steel Flooring. Mitco Shur-Site Treads and Mitco Armorgrids. Light and Heavy Steel Plate Construction.

3. The build-up of sticky dusts on the rotor may cause it to run out of balance.

4. If sprays are used these are the usual problems of water cost and availability, possible corrosion and the handling of the dust in the form of sludge.

Some rotary type dust collectors are designed as high efficiency units while others are intended for low efficiency use. Where the collection efficiency must be high, that is 80 percent to 95 percent, it is recommended that either field or laboratory tests be made before deciding upon the purchase of this type equipment unless conditions exactly duplicate an installation in use.

Industrial Limestones in Virginia

VIRGINIA GEOLOGICAL SURVEY is making a thorough study of the limestones which have the greatest possibilities for industrial use as an important part of its war work and post-war planning.

The State contains enormous deposits of limestone. Some are highly suitable for use in chemical industries. Others are very useful to numerous stone and building industries and to agriculture. The geologic factors controlling the distribution, thickness, grade, and availability of these rocks are complex. Therefore, all of the limestone areas need careful field study to discover the most promising places for commercial development. Many chemical analyses must be made to determine the suitability of the limestones for particular industrial uses.

Arthur Bevan, State Geologist, advises that field studies and a part of the laboratory work have been completed in four selected districts. All of them are in the Valley province, west of the Blue Ridge, where most of the limestones of Virginia occur.

Two districts in the middle part of the Valley were surveyed last summer by Dr. R. S. Edmundson and Dr. B. N. Cooper, of the State Geological Survey. One district is along the main line of the Norfolk and Western and the Virginian railroads from the West Virginia line to Roanoke. This investigation included the limestones of Giles, Montgomery, Botetourt, and Roanoke counties, which are reasonably close to railroads. The other district studied during 1943 was along the main line and the James River division of the Chesapeake and Ohio railroad in Alleghany, Botetourt, Rockbridge, and Augusta counties. The Buchanan-Glasgow portion of this district is also served by the Norfolk and Western railroad.

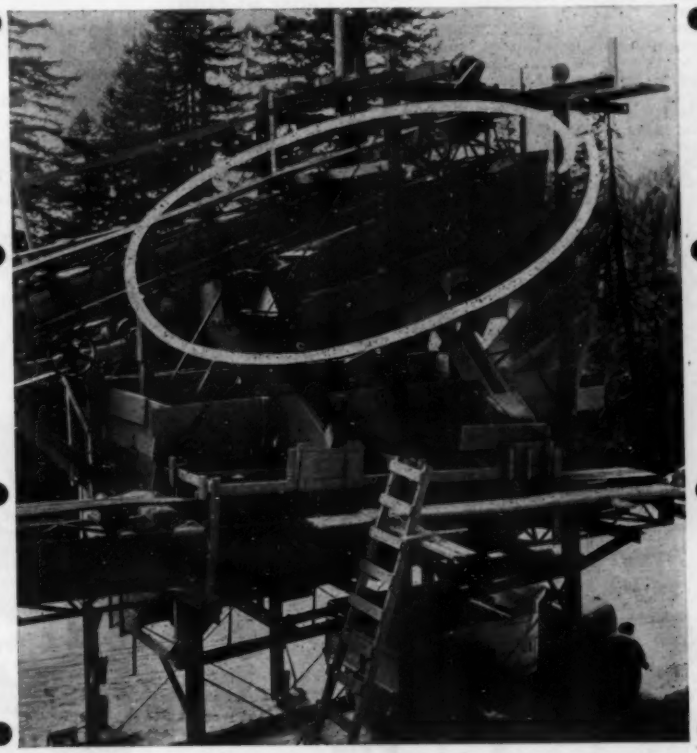
Another limestone district includes the northern part of Shenandoah Valley in Clarke, Frederick, Shenandoah, Warren, and Page counties. Field work in this area was done by Dr. Edmundson. In southwestern Virginia, Dr. Cooper has investigated the limestones of the Clinch Valley district in Tazewell, Russell, Wise, and Scott counties.

The main purpose of these studies was to discover additional bodies of high-grade limestone and dolomite from which raw materials may be readily obtained for war and post-war uses. The investigations have resulted in the discovery of several large bodies of high-grade limestone.

Data are now available to interested operators and industries, at the offices of the Virginia Geological Survey in Charlottesville. These data will in time be published in Survey mineral resources reports. The data include the distribution, physical character, chemical composition, structure, and thickness of the limestones, and information on possible quarry sites and accessibility to transportation.

Houston, Tex., Paving

THE CITY COUNCIL of Houston, Texas, will spend $111,239 for gravel and shell paving materials and other improvements on 13 miles of dirt streets.



4' x 12' Triple Deck Screen, Handling 2000 Tons Per Day of 18" Down Rock in a Temporary Plant

Simplicity Gyrating Screens are at work in every state in this country, in Alaska, Canada, Mexico and other foreign lands. The reputation earned by these universally used screens is best expressed by this statement made by one of the army of satisfied Simplicity users, "It is hard to believe, but we are now getting 50% more capacity from our plant, with the only change in our equipment being the replacement of our screening unit with the same size Simplicity Gyrating Screen. The cost of operation has also been greatly reduced."

A guaranteed Simplicity Screen produces results.

SIMPLICITY ENGINEERING COMPANY

DURAND, MICHIGAN

Washington News

(Continued from page 37)

having the National Housing Agency Allotment symbol H-1. The prices allowed are as follows:

Shipping point origin. Indiana, Iowa, Michigan, Oklahoma, Texas, Ohio:

	Per M sq. ft.
Gypsum wall board ¼"	$20.00
Gypsum wall board ⅜"	23.00
Gypsum wall board ½"	25.00
Gypsum lath	13.00
Gypsum sheathing ½"	20.00
Gypsum sheathing (weatherproof treated) ½"	22.50
Gypsum board roof units (laminated) ¾"	54.00
Gypsum board roof units (laminated) 1"	58.00
Gypsum board roof units (laminated 1½"	87.00
Gypsum board roof units (laminated) 2"	116.00
Gypsum board sheathing (laminated ¾"	44.00
Gypsum board sheathing (laminated) 1"	48.00
Gypsum board sheathing (weatherproof treated, laminated) 1"	53.00
Gypsum board partition panel (laminated) 1"	58.00
Gypsum board partition panel (laminated) 1½"	87.00

Farm Construction

W.P.B. Part 1075, Conservation Order L-41 as amended April 19: This order regulates farm construction expenditures, and now allows $1000 annually for new farm construction per farm. However not more than $200 of this sum may be spent on any farm house on the farm. A "farm" means a place used primarily for raising crops, livestock, dairy products, poultry, etc., for the market.

Concrete Block Prices

O.P.A. Region III Order G-2 Under MPR 188: An order has been issued as of April 13 adjusting maximum prices for concrete blocks in the Marion County, Indiana, area.

(a) Any manufacturer of concrete blocks may sell such blocks, in the Marion County, Indiana, area, at prices not exceeding,

(1) Its present legally established maximum prices, or

(2) The maximum prices hereinafter set forth.

(b) Any such seller shall, however, maintain all customary discounts, allowances, or price differentials.

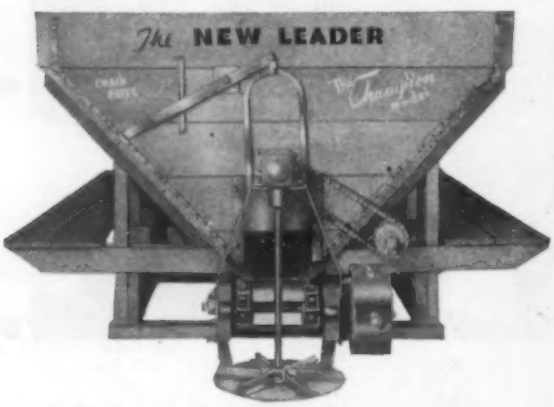
(c) The schedule of adjusted maximum prices for concrete blocks permitted by this order is as follows:

COMMODITY, CONCRETE BLOCKS

Size and shape	Adjusted maximum price[1]
3x8x16, Solid	$0.11
3x8x12, Solid	.09
3x8x8, Solid	.06
3x8x4, Plugs	.03½
4x8x16, Hollow	.09
4x8x16, Solid Spls.	.11
4x8x12, Solid	.09
4x8x8, Solid Spls.	.06
4x8x4, Plugs	.03½
6x8x16, Plain	.11
6x8x16, Headers	.13
6x8x16, Spls.	.13
6x8x8, Spls.	.06½
8x8x16, Plain	.12
8x8x16, Spls.	.14
8x8x8, Spls.	.07
8x8x16, Headers	.14
8x8x16, Angle-block, Handmade	.25
8x8x16, Vent-block, Handmade	.80
8x8x12, Three-quarters	.14
8x8x16, Rock Face	.14
8x8x16, Rock Face Spls.	.16
8x8x8, Rock Face Spls.	.08
10x8x16, Plain	.15
10x8x16, Spls.	.17
10x8x8, Spls.	.08½
10x8x18, Corners	.20
12x8x16, Plain	.18
12x8x16, Spls.	.20
12x8x8, Spls.	.10
12x8x12, Bull-nosed Column	.25
5x8x16, Plain	.12
5x8x16, Spls.	.14
5x12x16, Plain	.16
5x12x16, Spls.	.18
7x16x16, Chimney Block 9" flue	.65
7x16x16, Chimney Block Thimble Unit	.80
4x8x9, Flue-block	.08
4x8x3, Flue-block	.10
4x8x17, Flue-block	.12
4x8x13, Flue-block Thimble Unit.	.30
1⅛x8x16, Furring-block	.06

[1] Prices quoted are on a delivered basis. Yard prices shall be equal to delivered prices on quantities less than $100.00. On quantities amounting to $100.00 or more, yard sales shall be subject to a discount of 5% of above prices.

(d) This order shall apply to all sales of concrete blocks pursuant to which actual physical delivery occurs



FOR BETTER LIME AND MARL SPREADING

Use the NEW LEADER Truck-Body Type Lime Spreaders . . .

GOOD NEWS!

You can now buy NEW LEADER Truck Body Type Lime Spreaders without Triple AAA Certificates or Priorities.

These spreaders have all the characteristics required for profit-making spreading. They embody the latest spreading improvements. The extra-heavy-duty pintle type conveyor chain gives positive-feed for self-unloading. Will spread wet or dry lime uniformly from 35 to 45 ft. in width. Of heavy construction and reinforcement, they are built to stand hard usage.

Write today for our latest catalog showing the new model Wide Bottom, equipped with two distributor discs. This spreader will handle wet lime and marl and is strictly a one-man spreader.

HIGHWAY EQUIPMENT COMPANY, INC.

Manufacturers of the World's Most Complete Line of Spreaders, including Lime Spreaders, Sand and Cinder Spreaders, Chip Rock, Clay and Dirt Spreaders.

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We have in stock the following types of Welding Wire for electric arc welding:

STAINLESS STEEL ELECTRODES
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Quick delivery, also, on Welding Machines, Protect-O-Metal for the elimination of weld spatter and Havens "C" Protected Clamps. Your inquiries will receive prompt, courteous attention—phone, write or wire our warehouse nearest you.

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CLEVELAND (14) · MILWAUKEE (1) · NEWARK (1), N. J.
PITTSBURGH (12) · ST. LOUIS (3) · TWIN CITY-*St. Paul* (4)

UNITED STATES STEEL

within the limits of Marion County, Indiana.

Portable Concrete Mixers

W.P.B. Part 1157, Limitation Order L-217, Schedule V, amended April 24:

On and after March 15, 1944, no producer shall put into process any materials for the manufacture of portable construction concrete mixers, running gear, or accessories and attachments which do not conform to the sizes and types established in paragraphs (c), (d) and (e) hereof. Nothing in this paragraph (b) (1) shall be deemed to prohibit the use of any such materials which may have been in transit to such producer or in process by him on that date.

(2) Nothing in this schedule shall be deemed to restrict the production of repair parts.

(c) Limitation on sizes and types of portable construction concrete mixers. Producers are limited to the following sizes and types of portable construction concrete mixers:

(1) 3½ cu. ft., tilting drum type.

(2) 7 cu. ft., two opening drum type.

(3) 10 cu. ft., two opening drum type.

(4) 14 cu. ft., two opening drum type.

(d) Limitation on sizes and types of running gear. Producers are limited to the following sizes and types of running gear:

(1) Side discharge on two-wheel mounting for 3½ cu. ft. size of portable construction concrete mixer.

(2) End discharge on two wheel mounting for 7 cu. ft. and 10 cu. ft. sizes of portable construction concrete mixers (except to fill orders placed by or for the account of the Army, Navy, Maritime Commission or War Shipping Administration).

(3) End discharge on four wheel mounting for 14 cu. ft. size of portable construction concrete mixer (except to fill orders placed by or for the account of the Army, Navy, Maritime Commission or War Shipping Administration).

(4) Skid mounting for 7, 10 and 14 cu. ft. sizes of portable construction concrete mixers.

(e) Limitation on sizes and types of accessories and attachments. Producers are limited to the following sizes and types of accessories and attachments:

(1) Power loading skip for the 7, 10 and 14 cu. ft. portable construction concrete mixers.

(2) Skip shaker for the 7, 10 and 14 cu. ft. portable construction concrete mixers.

(3) Water measuring tank for the 7, 10 and 14 cu. ft. portable construction concrete mixers.

(4) Batch meter for the 7, 10 and 14 cu. ft. portable construction concrete mixers.

(5) Auxiliary water pump for the 7, 10 and 14 cu. ft. portable construction concrete mixers.

(6) Gated batch-hopper for the 14 cu. ft. portable construction concrete mixer only.

(7) Auxiliary hoist for the 14 cu. ft. portable construction concrete mixer only.

Tax on Transportation of Property

On June 1, 1944, the existing exemption of the transportation tax so far as federal agencies are concerned is discontinued, regardless of who pays the transportation charges or how materials are consigned. The exemption continues to apply, however, on amounts paid for the transportation of property to or from the government of a State, Territory of the United States, or political subdivision thereof, or the District of Columbia, according to a recent statement by Secretary W. Vernon Brumbaugh of the National Lime Association.

During the period from December 1, 1943, to May 31, 1944, inclusive, an amount paid for the transportation, originating on or after December 1, 1943, of property to or from the Government of the United States, is exempt from the tax.

Where the shipping papers show the consignor or consignee to be the Government of the United States, or any agency or instrumentality thereof, such papers may be accepted by the carrier as proof of the exempt character of the shipment. A United States bill of lading may likewise be accepted as evidence of the exempt character of the shipment. No exemption certificate is required.

HERE'S A Conversion YOU CAN MAKE Now

To Boost Production *Today*
To Cut "*Changeover*" Costs *Tomorrow*

Boost production today with a new Climax engine drive, and get more work out of old but serviceable machinery.

For stationary work you can make substantial operating economies through the higher efficiencies, valuable heat recoveries and negligible maintenance costs obtained.

For portable service a new Climax engine brings lighter weight, easier handling and greater operating flexibility.

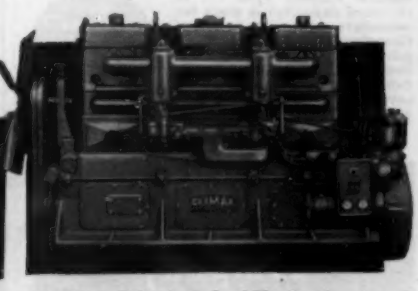
You can "changeover" economically with a Climax engine and put your machinery in top shape for postwar work.

If you are planning new equipment, the "tailored" advantages of these engines are a solution to many machine design problems.

For information, write Climax Engineering Co., 1810 South Fourth Street, Clinton, Iowa.

Climax Engines are 4, 6, 8 and 12 cylinder gas engines with ratings from 8 to 495 hp. The engines operate on natural gas, butane, gasoline or other fuels.

Climax Generating Sets consist of a Climax engine directly connected to an AC or DC generator, in over 100 sizes from 300 watt to 312 KVA.



"For High Achievement in the Production of War Material"

Climax Engineering Company

GENERAL OFFICES & FACTORY: CLINTON, IOWA

REGIONAL OFFICES: CHICAGO, ILL., DALLAS, TEXAS

The Climax R6I valve-in-head Blue Streak engine above develops 180 hp. at 1200 r.p.m.

New
JOHNSON
all-Welded
BUCKETS

New and exclusive Johnson features give this new streamlined bucket efficiency-promoting and life-prolonging advantages in all centers of action.

Needle Bearings Sealed Against Dirt

All-Welded Construction Reduces Digging Resistance

Its all-welded construction eliminates power-wasting bolts and rivets . . . provides greater stability through proper weight distribution.

A renewable lip edge bar, of durable manganese steel, gives greater digging efficiency and many times the life of the ordinary steel lip construction.

Renewable Manganese Steel Lip Edge

Large Diameter Sheaves Increase Rope Life

Guide sheaves replace conventional cross-rollers . . . greatly reducing cable wear. Needle bearings (protected against dirt by special synthetic rubber seals) are used on all closing sheaves.

General Purpose Type (½ to 1½ yard capacity) in stock for immediate delivery to U. S. and Canadian contractors with required Government authorization. The line also includes Rehandling Buckets ½ to 2½ yards, Heavy Digging ½ to 1½ yards.

Get Data on Johnson Bins —Batchers— Ready-Mix Plants

The C. S. Johnson Company
Champaign, Illinois

Thermal Expansion of Aggregates

Bureau of Standards studies concrete aggregates

CONCRETE FAILURES have often been attributed to deleterious constituents in the aggregate. It has been suggested that the thermal expansion characteristics of some of these materials are such as to affect adversely the resistance of concrete to failure when exposed to wide temperature variations. Included in a general investigation of concrete aggregates at the National Bureau of Standards was a study of dimensional changes of widely used aggregate materials over the temperature range —20 deg. to +60 deg. C (—4 deg to +140 deg. F). A report on this subject by W. H. Johnson and W. H. Parsons has been published as RP 1578 in the *Journal of Research* for March.

Specimens of the various rocks and mineral fractions of commercial concrete aggregates from 26 different sources were tested by the optical interferometer method to determine their thermal expansions. The materials included chert, opal, quartz, quartzite, sandstone, granite, diorite, andesite, basalt, limestone and dolomite. A few measurements were made also on crystals of calcite quartz, and microcline feldspar in various crystallographic directions.

The average coefficients of linear thermal expansion per degree centigrade between —20 deg. and +60 deg. C (not including the single crystals) ranged from an average of 13.4×10^{-6} for the opaline cherts to an average of 4.4×10^{-6} for the limestones. The least variation in expansivity for any one type occurred among the cherts; the average coefficient of thermal expansion of these was found to be 11.1×10^{-6} per degree centigrade between —20 deg. and +60 deg. C. Most of the expansivities of the aggregate materials, with the notable exception of some limestones, were close to the range of thermal expansions of hardened portland cements. The crystals of calcite, quartz, and microcline feldspar have different expansivities in various crystallographic directions. This was most pronounced in calcite, which has coefficients of 26.3×10^{-6} per degree centigrade parallel to the crystallographic C-axis and -4.8×10^{-6} perpendicular to the C-axis.

The results indicate that crystal orientation of the mineral components, texture, and mineral composition of rocks affect the thermal expansivity of the aggregates. Orientations and textures that might cause an aggregate to be incompatible with cementitious materials under extreme temperature variations have been pointed out. Several specimens had irregular expansion curves, and in some cases actual contraction occurred upon heating through certain temperature ranges.

Sufficient evidence has been found to warrant consideration of the thermal expansivity of the aggregate materials when the resultant concrete is to be exposed to severe temperature variations.

Sand-Lime Brick Production and Shipments

FOUR active sand-lime block and brick plants reported for March and four for February, statistics for which were published in April, 1944.

AVERAGE PRICE FOR MARCH

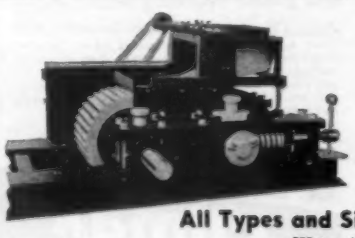
	Plant Price	Delivered Price
Detroit, Mich.	....	$17.00
Saginaw, Mich.	$15.00	....
Grand Rapids, Mich.	....	15.00
Seattle, Wash.	19.50	21.50

STATISTICS FOR FEBRUARY AND MARCH

	*February	†March
Production	938,875	694,405
Shipments (rail)	.....	.....
Shipments (truck)	941,998	634,405
Stocks on hand	667,000	882,000
Unfilled orders	1,170,000	870,000

*Four plants reporting: incomplete, one not reporting stocks on hand and two not reporting unfilled orders.

†Four plants reporting: incomplete, one not reporting stocks on hand and two not reporting unfilled orders.



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All Types and Sizes to Suit the Job
Write for bulletins.
Also Rebuilt Equipment

NEW HOLLAND MACHINE CO.
NEW HOLLAND PENNSYLVANIA

Post-War Road Hearings

OUT OF THE WELTER of spirited sessions on the House Roads Committee hearings involving H.R. 2426, it is expected there will be quite a few changes in the bill as originally proposed. The measure, sponsored by the American Association of State Highway Officials, proposes a $4,000,000,000 street and highway development program during the first three years following the end of the war, with 75 percent of the money to be supplied by the Federal government and 25 percent by the States.

It would change the formula for apportioning funds among the States from the regular method of one-third on the basis of population, one-third on the basis of area and one-third on post road mileage to one-half population, one-fourth area and one-fourth post road mileage in order to give a larger percentage of Federal funds to the most populous States that are confronted with problems of serious urban traffic congestion.

Although it was generally known that minority opposition to the proposed formula existed within the ranks of AASHO, questions by Committee members and replies from witnesses further indicate that:

1. There may be a compromise on the matching of funds somewhere between the regular 50-50 basis and the 75-25 proposed in the bill, or

2. Post-war funds for rural roads may be allocated on the basis of the regular Federal-aid formula with an additional authorization for work within metropolitan areas to be distributed according to a separate formula.

Reduced Slate Demand

SLATE sold at quarries in the United States in 1943 amounted to 468,860 short tons valued at $4,870,237, according to figures compiled by the Bureau of Mines, United States Department of the Interior, from reports furnished by slate producers. This was a decrease of 21 percent in quantity and 23 percent in value compared with 1942; 590,770 short tons valued at $6,360,223.

Roofing slate sold in 1943 amounted to 96,220 squares valued at $841,750. This represented a decrease of 50 percent in quantity and 51 percent in value compared with figures for 1942 —192,070 squares valued at $1,704,053. Sales in the Pennsylvania area (77,270 squares valued at $648,237) were 39 percent lower in both quantity and value than in 1942. In the New York-Vermont area sales declined to very low levels. Roofing slate sold in Virginia in 1943 amounted to 11,900 squares valued at $122,932, a decrease of 43 percent in quantity and 38 percent in value.

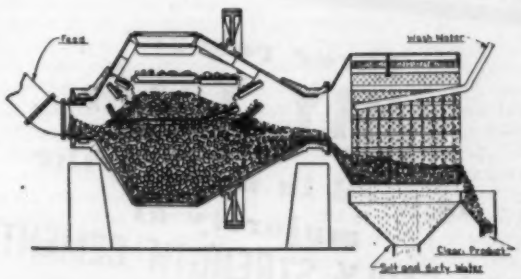
Sales of mill stock, which includes all slate sold for structural and sanitary purposes, electrical use, blackboards, bulletin boards, school slates, billiard-table tops, and similar uses were 2,644,140 sq. ft. valued at $938,368, a decrease of 18 percent in quantity and 16 percent in value from the 1942 output of 3,213,410 sq. ft. valued at $1,112,426. Remarkable gains were registered in sales of grave vaults and covers and billiard-table tops, whereas all other uses of mill stock declined greatly.

Slate sold for flagging, cross-walks, stepping stones, and miscellaneous dimension slate amounted to 2,027,020 sq. ft. valued at $166,231, a decrease of 19 percent in quantity and an increase of 19 percent in value compared with 1942.

Sales of crushed slate for roofing granules and flour, which amounted to 395,550 short tons valued at $2,923,888, decreased 18 percent in quantity and 14 percent in value compared with 1942.

Lone Star Improvements

LONE STAR CEMENT CORPORATION, New York, N. Y., has set aside $4,920,000 for improvements to plants and equipment during 1944 and 1945, subject to priorities and permits. The board of directors authorized the purchase of $2,000,000 in government bonds during 1943 for this purpose.



For Cleaning and Scrubbing

Glass Sand, Crushed Stone, Gravel, Phosphate Rock and many other materials.

The Hardinge Conical Scrubber removes fines and large clay balls with a small amount of water.

The Conical Scrubber consists of a rotating conical drum equipped with lifter flights and a trommel screen attached to the discharge trunnion.

Write for Bulletin 37.

HARDINGE

COMPANY INCORPORATED, YORK, PENNA.

NEW YORK CHICAGO SAN FRANCISCO TORONTO

Gypsum Safety Record

NATIONAL GYPSUM COMPANY, Buffalo, N. Y., reported recently that less working time was lost in its 20 plants because of industrial accidents in 1943 than in any previous year of the company's operation. This was accomplished despite a general increase of six percent in total man-hours worked by all the approximately 3000 employes. Employes in the plants during 1943 lost less than half a day per 1000 hours worked which was 80 percent better than the previous lost time record for plants in 1942.

Six of the gypsum company plants were first place winners in safety compaigns and three plants were second place winners. The gypsum plants at Akron and Clarence Center, N. Y., and the company's paper mill at Newburgh, N. Y., took first place honors in the Associated Industries of New York State Safety Campaign; the Dover, N. J., rock wool plant won first prize in the Safety Campaign conducted by the Industries of New Jersey and the York, Penn., lime plant took first place in the National Lime Association's contest. In the first safety campaign to be held by the Gypsum Association, the Clarence Center, N. Y., and National City, Mich., plants won top honors in Classes A and B respectively, while the Saltville, Va., plant took second place in Class A, the Akron, N. Y., plant second in Class B and the Medicine Lodge, Kans., plant won second place in Class C. Three plants, Akron, N. Y., National City, Mich., and York, Penn., had no lost-time accidents in 1943.

Three reasons
WHY TDA
is used in making the majority of
HIGH EARLY STRENGTH CEMENTS

1. TDA is a powerful grinding aid.
2. TDA assures the manufacture of a uniform product.
3. TDA improves the desirable properties of the resulting concrete, particularly in strength, plasticity and durability.

TDA is not an air-entraining agent and does not lower the density of concrete. It is the only addition to High Early Strength Cement permitted by ASTM.

DEWEY AND ALMY CHEMICAL COMPANY
CAMBRIDGE 40, MASSACHUSETTS

Cement Production Lower

BUREAU OF MINES reports that production of 5,686,000 bbl. of finished portland cement during February, 1944, was 45 percent below output in the same month of 1943; a slightly less severe rate of decline than the 50 percent decrease noted in January. Following the beginning of the downtrend in February, 1943, the rate of decline in monthly output was accelerated each month to a maximum for 1943 of 43 percent in November. The rate was lessened slightly in December but it advanced to 50 percent in January. The fluctuation in the monthly rate of decline between 41 and 50 percent since October, 1943, may indicate a possible easement of the rate in the near future.

Shipments of finished cement during February, 1944, totaled 5,055,000 bbl. or 42 percent below the volume shipped in the corresponding month of 1943. Production exceeded mill shipments during the month and stocks increased slightly more than 600,000 bbl. over those on January 31 to a total of 25,059,000 bbl. on February 29. When prospective future demand is considered, the end-of-February stocks might be termed as at a fairly high level.

The following statement gives the relation of production to capacity, and is compared with the estimated capacity at the close of February, 1944, and of February, 1943:

RATIO (PERCENT) OF PRODUCTION TO CAPACITY

	Feb., 1943	Feb., 1944	Jan., 1944	Dec., 1943	Nov., 1943
The month	54.0	29.0	30.0	40.0	46.0
12 months.	74.0	49.0	51.0	54.0	56.0

How Much Building?

JOHN B. BLANDFORD, JR., administrator of the National Housing Agency, says that the country needs and can finance from private sources a program of 1,000,000 to 1,500,000 housing units a year for a period running from 10 to 20 years after the war. Before the war the average number of housing units constructed was 600,000 units a year, but it is expected that there will be big backlog accumulation of housing needs in the post-war era.

Sell Concrete Concern

THE NEW ENGLAND CONCRETE CO., Providence, R. I., sold its general building and concrete machinery, equipment, and tools at public auction on April 12. State Director of Public Works Daniel J. Ryan was president of the company.

New Industrial Insulation Products

TO EMPHASIZE the need for conserving fuel in industrial plants, the Bureau of Mines has issued Information Circular, No. 7263, on the sources, properties, and uses of mineral products that are suitable for heat insulation. An opening paragraph contains a warning: "Should fuel become increasingly scarce and rationing become necessary, the plants less directly connected with the war program probably would suffer curtailment in activity."

Mineral wool, asbestos, and basic magnesium carbonate continue to lead the insulating field in both tonnage and dollar value, for boilers and pipe covering and in insulating cements, according to the Circular. Vermiculite, a name applied to a group of micaceous minerals, and used as a lightweight aggregate in concrete as well as a loose house fill, has won wide appreciation as an insulating material in the past 20 years, as shown in the tonnage production tables. Diatomite, known also as tripolite, kieselguhr, and diatomaceous earth, and well adapted for high-temperature insulation in ovens, cookers, furnaces, and kilns as well as for low temperature insulation in refrigerating plants, has shown a steady tonnage increase through the years.

The Circular also describes several minerals that have been found to have merit for insulating purposes. Certain chemicals when added to calcined gypsum react with mixing water and liberate gas, which expands the mass to a light porous body having fair insulating qualities. Such expanded gypsum is used chiefly for home insulation, but it may be used for insulating flat or slightly curved surfaces in industrial plants. It can be used only for low temperature insulation, because it begins to calcine, with consequent disintegration, at about 250 deg. F.

Although pumice, a cellular, glassy, volcanic rock, has a structure suitable for insulating purposes no production for this use has been recorded in the United States. Pumice is now used primarily as an abrasive.

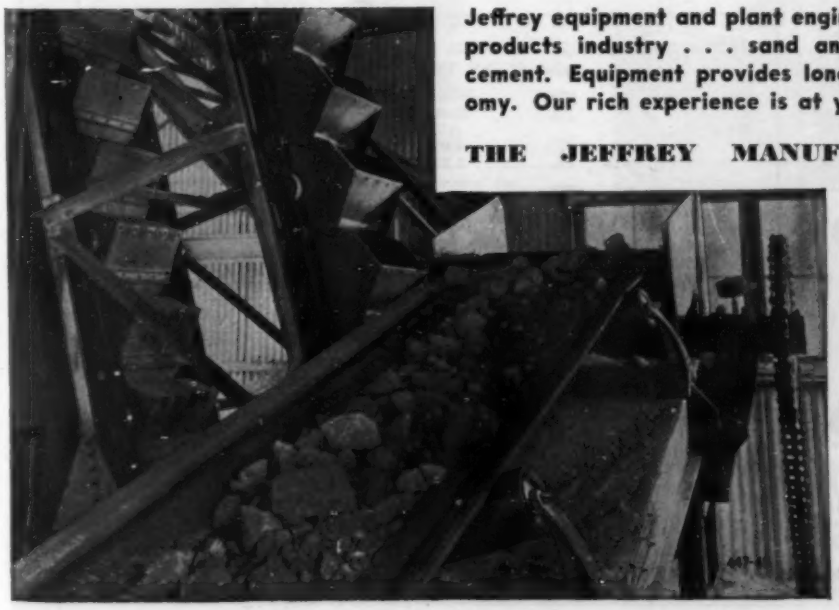
Pumicite has merit when used for insulation. A volcanic ash, originating from viscous lavas blown with volcanic force from volcanoes, pumicite resembles fine glassy sand or crushed glass. Pumicite is suitable for steam- and water-pipe insulation, boiler lagging, and for linings for cold storage rooms. Bureau of Mines records that not more than 600 tons annually have been sold for insulating purposes in recent years.

Silica aerogel appears to have promising possibilities as an insulator. Its manufacture is based upon the principle that if silica gel is heated under sufficient pressure to prevent evaporation within the gel, no gas phase forms until the critical temperature of the liquid is reached. At this point the liquid phase is converted to the gaseous phase, thus avoiding a gas-liquid interface. Under these conditions the gas may be withdrawn without causing collapse of the solid structure. The resulting product is a light, friable, siliceous, opalescent solid containing as much as 95 per cent air space by volume. It is said to have a density as low as 1.8 lb. per cubic foot. It was first applied where extreme differences in temperature exist, such as in high-temperature laboratory furnaces and extremely low-temperature freezing chambers. Extensive application to many uses is forecast for silica aerogel although it has passed little beyond the experimental stages.

A lightweight concrete in which Haydite, an expanded clay product, is used as an aggregate, has been applied to several industrial insulation uses. A concrete of this type weighing 80 pounds per cubic foot has a thermal conductivity of 2.5 at 75 deg.

Jeffrey

CHAINS	FEEDERS	PULVERIZERS	SHREDDERS
CONVEYORS	GRINDERS	PULLEYS	SPROCKETS
CAR PULLERS	IDLERS (Belt)	MONO-VEYORS	TAKE-UPS
CRUSHERS	GEARS	SCREENS	WAYTROLS
ELEVATORS	PORTABLES	TRANSMISSION	MACHINERY



Jeffrey equipment and plant engineering cover the entire stone products industry . . . sand and gravel, crushed stone and cement. Equipment provides long service and maximum economy. Our rich experience is at your disposal.

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Established in 1877

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Baltimore, Birmingham, Boston, Buffalo, Charleston, Chicago, Cincinnati, Cleveland, Denver, Detroit, Harlan, Huntington, Houston, Milwaukee, Pittsburgh, Philadelphia, New York, Scranton, Salt Lake City, St. Louis

Jeffrey bucket elevator (heavy duty type) and belt conveyor are shown at left. They are handling crushed stone in a large quarry operation. Jeffrey units will speed up schedules—will soon pay for themselves.

Write for your copy of the CATALOG

KNOX
Valves-Couplings-Nipples-Clamps-Headers

KNOX MANUFACTURING CO.
818 Cherry St. Phila. 7, Pa., U.S.A.
SINCE 1911 PRODUCERS OF
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F., and if high-alumina cement is employed it may be used where temperatures are as high as 2000 deg. F. If the Haydite is replaced in part with expanded vermiculite, the heat conductivity and weight per cubic foot are reduced with minimum loss of strength. Haydite concretes have been employed for high-temperature insulation, for furnace coverings, and as baffles in boilers, oil-distillation equipment, Cottrell dust precipitators, and industrial stacks.

Lightweight aggregates, such as Haydite, may be used alone as low-conductivity fillers.

A copy of Information Circular 7263, Industrial Insulation with Mineral Products, may be obtained by writing to the Bureau of Mines, U. S. Department of the Interior, Washington, D. C.

Lime Sales Boom

BUREAU OF MINES figures recently released show that sales of lime in 1943 advanced to a new record volume of 6,394,000 short tons or five percent over the 1942 sales. The new record resulted from the increased demand for agricultural and chemical lime and dead-burned dolomite which more than compensated for a sharp decline in demand for building lime. Sales of both quick- and hydrated lime were larger than in 1942 in each of the major uses except for building purposes in which the tonnage of each type sold was markedly lower. In 1943, quicklime represented 79 percent and hydrated lime 21 percent of total sales. The second year of war effected further changes in the distribution of sales by uses, and chemical lime represented 64 percent, dead-burned dolomite 19 percent, building lime 9 percent, and agricultural lime 8 percent of the total sales compared with the corresponding percentage distribution in 1942 of 62, 20, 11, and 7 respectively.

Plan for Disposal of War Construction Equipment

CONSTRUCTION EQUIPMENT purchased by the United States government for use all over the world should be used by existing federal agencies or sold to state and local tax supported bodies with the balance disposed of through established channels. This suggestion was offered by the Associated Equipment Distributors who are concerned about the proper disposition of a billion dollars worth of shovels, bulldozers, tractors, etc., both during the latter stages of the war and in the post war period.

A resolution on the problem was submitted by the distributors organization, with full A. E. D. approval, to the various chairmen of the Senate and House committees, to the Surplus War Properties Administrator, chairman of the Senate Post-War Committee, the chairman of the House Post-War Committee, the U. S. Chamber of Commerce, the National Association of Manufacturers, the American Road Builders Association and the Associated General Contractors.

The Associated Equipment Distributors declared that the proper disposal of such equipment, affecting as it will returning soldiers and war workers now or at war's end, and also affecting the pocketbooks of taxpayers in a large way, becomes a vital problem which should be settled in principle now by the Congress. This is especially true inasmuch as the Treasury Procurement Division is already beginning to dispose of surplus government supplies.

TABLE 1—LIME SOLD OR USED BY PRODUCERS IN THE UNITED STATES, 1942-43, BY TYPES AND MAJOR USES

	1942		1943 (Preliminary)	
	Short Tons	Value	Short Tons	Value
By types:				
Quicklime	4,810,452	$34,077,137	5,055,000	$37,006,000
Hydrated lime	1,293,339	10,290,304	1,339,000	10,676,000
Total lime	6,103,791	$44,367,441	6,394,000	$47,682,000
By uses:				
Agricultural:				
Quicklime	184,678	$ 950,374	195,000	$ 1,206,000
Hydrated lime	215,953	1,568,579	293,000	2,260,000
Total	400,631	$ 2,518,953	488,000	$ 3,466,000
Building:				
Quicklime	175,643	$ 1,644,316	140,000	$ 1,310,000
Hydrated lime	522,034	4,528,889	439,000	3,713,000
Total	697,677	$ 6,173,205	579,000	$ 5,023,000
Chemical and industrial:				
Quicklime	3,220,774	$20,664,813	3,468,000	$23,404,000
Hydrated lime	555,352	4,192,836	607,000	4,703,000
Total	3,776,126	$24,857,649	4,075,000	$28,107,000
Refractory (dead-burned dolomite)	1,229,357	$10,817,634	1,252,000	$11,086,000

AT EVERY POINT of WEAR

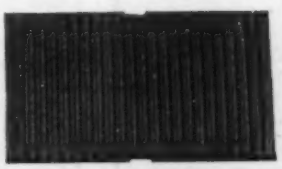
ORO WILL LAST LONGER

ORO

Supermang Repairs for

Crushers, Shovels, Pulverizers, Elevator and Conveyor Chains, Apron Feeders, and Ball, Rod and Tube Mills save you money because of their long life. ORO Supermang is a Superior Grade of Manganese Steel made by alloying regular 11 to 14% manganese steel to give a superior longer-lasting metal for wearing parts. Write today for our literature showing improved designs of repair parts that give your equipment better and longer service.

Supermang Replacement Dipper Tooth



Supermang Replacement Crusher Jaw Plate

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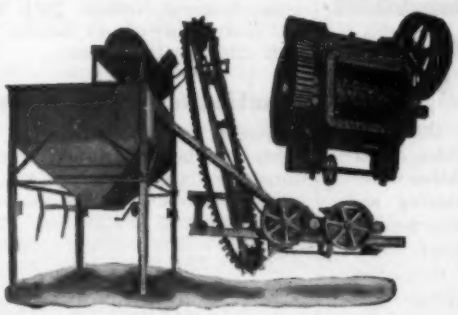
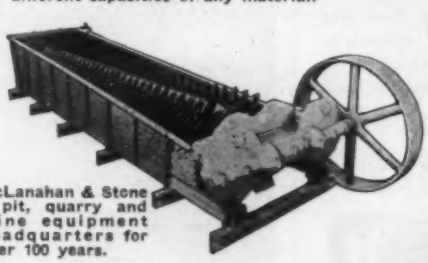
SCREENS • CRUSHERS



McLanahan equipment will prepare your plant for more business. Single and double roll and jaw crushers, hammermills, super dry pans — steel log washers and scrubbers, sand drags, revolving and vibrating screens, elevators, conveyors, dryers, jigs, and hoists—complete portable, semi-portable and stationary crushing, screening, and washing plants for different capacities of any material.

COMPLETE PLANTS

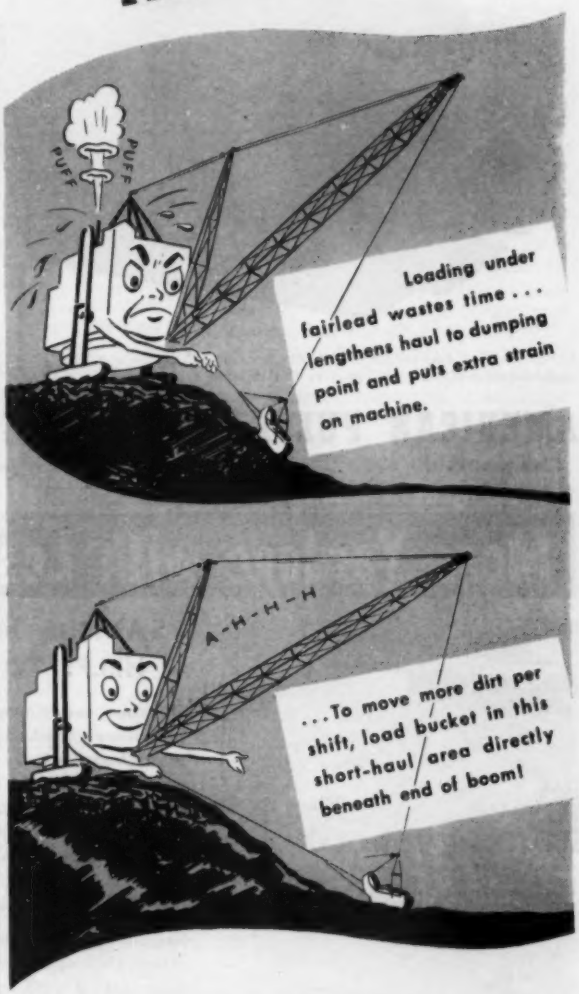


McLanahan & Stone — pit, quarry and mine equipment headquarters for over 100 years.

McLanahan & Stone Corp. Established 1835 HOLLIDAYSBURG, PENNSYLVANIA

DRAGLINE PRODUCTION TIP NO. 1

DON'T LOAD THE BUCKET UNDER THE FAIRLEAD!


PUFF
PUFF
Loading under fairlead wastes time . . . lengthens haul to dumping point and puts extra strain on machine.
A-H-H-H
. . . To move more dirt per shift, load bucket in this short-haul area directly beneath end of boom!

A Page AUTOMATIC Dragline Bucket digs and fills within 1 or 2 bucket lengths . . . no need to drag it in close to get a full load. Size for size and weight for weight, a Page AUTOMATIC will outdig any other dragline bucket made!

PAGE
Automatic DRAGLINE BUCKETS

PAGE ENGINEERING COMPANY, CHICAGO 38, ILL.

Ideally Fitted for Today's Market Demands

AMERICAN CRUSHERS

New markets for crushed stone that command greater profits are in agricultural limestone, carefully graded stone sand of round grains, and coarse aggregates that are free from slivers. Plant managers are cashing in on these profitable markets with AMERICAN CRUSHERS. Time-tested and proved, they produce more volume and more variety at lower operating cost. They are built of extra-heavy construction to withstand the most severe service.

Let us show you how an AMERICAN Crusher can combine low cost with maximum production for you. Send us your inquiries.

AMERICAN PULVERIZER CO.

1245 MACKLIND AVE. ST. LOUIS 10, MO.

More Yardage with Less Labor

Here is a small Sauerman Scraper (¼ cu. yd. size) moving sand from stockpile to concrete products factory. One man running machine two hours per day supplies plant with sand, a job that formerly kept three men hauling sand 10 hours a day.

This Sauerman Slackline Cableway digs down to the bottom of a deep gravel deposit and hauls the material to top of plant at cost of few cents per cubic yard.

SAVING MAN-HOURS HELPS TO WIN WAR

Wartime conditions demand that labor be conserved wherever possible. Sauerman Drag Scrapers and Slackline Cableways are chosen for excavating and stockpiling on defense projects because this simple, sturdy equipment has a long record of reducing the man-hours required on all kinds of long range material handling work.

Sauerman machines not only reduce labor; they also save in other ways. The first cost of a Sauerman machine compares favorably with the cost of any other equipment that will dig, haul and place an equal yardage of materials. Moreover, power requirements are moderate and the machine demands little by way of repairs, assuring a small daily expense.

Write for Catalog

SAUERMAN BROS., INC.

530 S. Clinton St., Chicago 7, Ill.

Attack F.T.C. Order

COUNSEL for cement companies are asking the U. S. Circuit Court of Appeals for a review of the Federal Trade Commission order demanding an end to present marketing practices. It is held by the cement companies that the order is unlawful and exceeds the jurisdiction of the Commission. It is also asserted that it "abridges and nullifies the petitioners' constitutional right to meet competition."

A motion has been filed by the cement companies for permission to present evidence originally offered by them at Commission hearings but which was rejected. This evidence is designed to show, it is claimed, that cement prices are not unreasonable, and profits not excessive, averaging 3.56 percent before taxes and 2.99 percent after taxes. On July 17, 1943, the Federal Trade Commission ordered the cement industry to discontinue its multiple basing-point, delivered-price system, long a basic formula in establishing cement prices throughout the country. It has been pointed out by the cement companies that under this system, if a cement manufacturer is situated less advantageously than his competitors in relation to the market he has to take business at the same figure charged by those competitors situated nearer the market and who pay less freight.

Build Ready Mix Plant

JOHN B. LAGARDE, Anniston, Ala., is now constructing a new ready mixed concrete plant which has some unusual features. Offices, bath houses, and scale house are all located in one unit underneath a ramp.

Continuous Hydrators

LIME & HYDRATE PLANTS CO., York, Penn., has been manufacturing some unusually large capacity automatic continuous hydrators for shipment to an undisclosed destination for war purposes. The Kuntz hydrators, shown in the illustration, are 27 ft. long and each has a capacity of 20 tons. They are designed for continuous operation, and are equipped with dust control and water feed and lime feed regulation.

Two large lime hydrators ready for shipment are destined for war purposes

Test Concrete Plank

(Continued from page 86)

Reinforcing rods are then placed in a recess provided for this purpose in the block and then covered with a concrete grout. Concrete block comprising the plank were 6- x 8- x 16-in. units.

As shown in the illustration, the plank were covered with a 1¼-in slab of concrete to simulate conditions in actual application where a smooth floor surface is desired. Concrete block were laid on the plank slab until the total load was 15,600 lb., and an ultimate load of 273 lbs. per sq. ft. The plank under test, fully loaded, showed a deflection of ¾ in. without failure.

Plank heretofore manufactured have been tested to 10-ft. clear span, and have received the approval of the Wisconsin Industrial Commission. The present test was to demonstrate the strength of the longer span and practicability of this construction for industrial as well as residential construction.

Mica Office Closed

E. J. WEMLINGER, district manager for Colonial Mica Corporation at Santa Fe, New Mexico, has announced that the office in this State will be discontinued. Some productive mines have been developed in the State and other encouraging prospects exist, but neither are in sufficient quantity, he said, to warrant the continuation of the office. Mr. Wemlinger will now make his headquarters in Los Angeles, Calif.

Explosives Sales Up

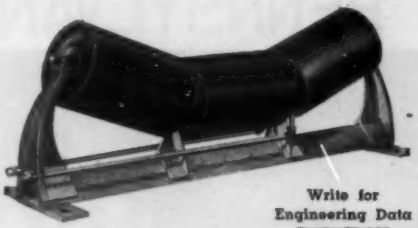
BUREAU OF MINES reports that sales of "permissible" explosives in the United States increased 10.3 percent in 1943 over 1942. Sales of all types of explosives, reported by manufacturers, which include black blasting powder, "permissible" explosives, and high explosives other than permissibles, decreased by 4.3 percent when compared with 1942. The survey did not include explosives used in the manufacture of ammunition, fireworks, sporting powder, or exports.

A total of 477,650,985 lbs. of explosives was manufactured and sold in 1943. This included 46,422,025 lbs. of black blasting powder (including both granular and pellet), 338,573,441 lbs. of high explosives other than permissibles, and 92,655,519 lbs. of permissible explosives. Ninety-nine percent of the permissible explosives was used for the mining of coal. This was the only type of explosive whose production increased in 1943 over 1942. Coal mining also used most of the black blasting powder; this one industry alone consumed 94 percent of the total sales of this class of explosives. High explosives other than permissibles had a more diversified use, the metal-mining industry requiring 36 percent of the total sales, quarrying and nonmetallic-mineral mining 24 percent, railway and other construction work 22 percent, coal mining 16 percent, and all other purposes 2 percent.

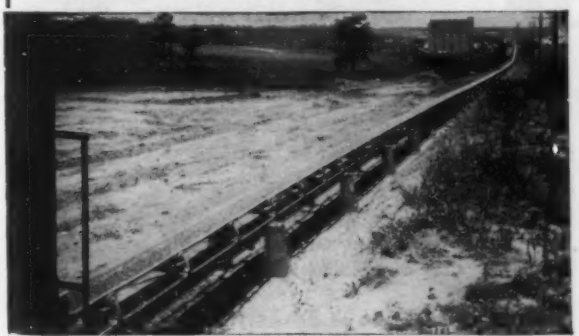
The coal-mining industry consumed nearly 190 million pounds of explosives in 1943. Forty-nine percent of this amount was permissible explosives, 28 percent was high explosives other than permissibles, and 23 percent was black blasting powder. The proportion of high explosives other than permissibles used in coal mines increased to 28 percent in 1943 from 24 percent in 1942; black blasting powder consumption in coal mines fell from 29 to 23 percent of all explosives used; permissibles maintained approximately the same proportion as in 1942. Sales of explosives for use in metal mines, of which high explosives other than permissibles was 99.9 percent of the total, increased 2 percent in 1943 over 1942. The metal-producing States showing the largest increase in the use of high explosives were Minnesota, Utah, and Arkansas. Sales of explosives for railway and other construction work decreased 30 percent in 1943 from the previous year. Quarries and nonmetallic-mineral mines also required less explosives in 1943, sales decreasing nearly 7 percent.

Haul It the Economical Way on CONTINENTAL Idlers

Belt Conveyors are one of the most economical and flexible systems for conveying bulk material. Continental's complete line of equipment combined with engineering "know-how" provides the means of realizing this economy. Send us your inquiries.



Write for Engineering Data Book ID-105



INDUSTRIAL DIVISION

CONTINENTAL GIN COMPANY

BIRMINGHAM, ALABAMA

CGC ATLANTA • DALLAS • MEMPHIS CGC

Financial

RECENT DIVIDENDS

	Amt.	Payable
Alpha Portland Cement Co.	.25	June 24
Lehigh Portl'd Cement Co.	.25	May 1
Lehigh Portland Cement Co., pfd.	1.00	July 1
Schumacher Wall Bd. Corp.	.25	May 15
Schumacher Wall Board Corp., pfd.	.50	May 15
Superior Port. Cem. Co., B.	.50	Apr. 29
Standard Silica Corp. Com. (pl)	.10	May 15

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RIVERSIDE CEMENT CO., Los Angeles, Calif., reported a net profit after all charges, of $269,814 for the year ended December 31, 1943. This compares with $403,338 for a like period ended December 31, 1942.

•

PACIFIC PORTLAND CEMENT CO., San Francisco, Calif., had a net income of $412,905 for the year ended December 31, 1943, which compares with $772,424 for a similar period ended December 31, 1942. Sales in 1943 were $5,681,839 as against $7,004,882 in 1942. The company last year retired 11,485 shares of the $100 par 6½ percent preferred. The company continues operations of cement plants at Redwood City, Calif., and Gold Hill, Ore. The San Juan Bautista plant in California is closed, and has been transferred to the non-operating plant account. The Redwood City wallboard plant and plaster mills in California and Nevada continue to operate. During 1943 there was spent $200,969 in additions and improvements against $135,123 in 1942 and $557,392 in 1941 when the wallboard mill was constructed.

•

SIGNAL MOUNTAIN PORTLAND CEMENT CO., Chicago, Ill., and Chattanooga, Tenn., showed net earnings after taxes of $47,000 for 1943. President John L. Senior, in addressing the stockholders at the recent annual meeting, said that the post-war outlook for the cement industry is very encouraging as a result of the large construction program that is anticipated. However, the 1944 outlook for the industry generally is unfavorable due to restrictions on private construction and the fact that the government construction program has been practically completed. Nevertheless, the outlook for the Signal Mountain company during the first six months of the year is somewhat better than for the first half of 1943.

PENNSYLVANIA GLASS SAND CO., Lewistown, Penn., presented the following financial report for the years ended December 31:

	1943	1942
Net sales	$5,407,756	$4,560,829
Costs & expenses	3,207,116	2,484,626
Depreciation & depletion	264,692	240,401
Operating profit	1,935,948	1,835,801
Other income	53,089	65,740
Total income	1,989,037	1,901,542
Bond interest	126,549	134,953
Bond disct., etc.	30,961	10,400
Fed. income tax	276,235	285,508
States income tax	41,059	26,694
Excess prof. tax	1,001,015	926,722
Debt retire. cred.	cr 91,201	cr 85,569
Post-war tax cred.	cr 8,900	cr 7,103
Net income	613,320	609,937
5% pfd. dividend	155,000	155,000
Common divs.	321,860	321,860
Surplus for year	136,460	133,077
Earn. surp., 1-1	997,538	864,460
Earn. surp., 12-31	1,133,998	997,538

•

LEHIGH PORTLAND CEMENT CO., Allentown, Penn., showed a net profit, after taxes, of $1,160,879 for the twelve months ended March 31, 1944, as compared with $1,718,879 for the twelve months ended March 31, 1943. Federal income taxes dropped from $4,332,630 in 1943 to $816,800 for the period ended March 31, 1944, or 81 percent.

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making fine feed for efficient raw grinding, in World's latest Cement Plant.

This is one of a rapidly increasing number of installations in the Cement, Lime, Gypsum and Process Industries, where alert Operators were quick to take advantage of the economies which REVERSIBLE operation affords,—

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- Automatic Hammer Turning and Resharpening,—
- Adjustment for Product Uniformity and Wear,—

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Fifteen (15) sizes to meet all requirements.

PUT YOUR REDUCTION PROBLEMS UP TO US!

LIBERTY TRUST BLDG. PENNSYLVANIA CRUSHER COMPANY PHILADELPHIA 7, PA.

"Industrial"

ACCURATE DEPENDABLE

GEARS RACKS SPROCKETS

Any Type
Any Quantity
Any Material

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THE PLANT THAT QUALITY AND SERVICE BUILT

INDUSTRIAL GEAR MFG. CO.

4544 VAN BUREN STREET CHICAGO 24, ILLINOIS

LONE STAR CEMENT CORPORATION, New York, N. Y., presented the following consolidated income account for the years ended December 31:

	1943	1942
Sales	$29,684,219	$34,918,772
Mfg. etc., expense	18,225,174	29,058,837
Selling, etc., exp.	2,830,727	3,003,169
Depr. & deplt.	2,013,834	2,259,981
General taxes	768,711	756,670
Operating profit	5,845,773	9,840,115
Other income	381,304	359,625
Total income	6,227,077	10,199,740
Serv. annuities	.....	439,728
Misc. charges	251,976	286,932
Income taxes	1,679,093	1,713,048
Excess prof. tax	1,700,000	4,760,000
Post-war tax cred.	cr 170,000	cr 476,000
Fgn. exch. adj.	42,092	32,693
Net income	2,723,916	3,443,339
Common divs.	2,845,791	3,082,940
Surplus for year	d 121,875	360,399
Earn. surp., 1-1	11,603,930	11,285,723
Fgn. exch. adj.	cr 107,238	cr 265
[1] Debits	43,083	42,457
Earn. surp., 12-31	11,546,210	11,603,930

[1] Amount transferred to statutory surplus of subsidiaries in Argentina and Brazil.

Total taxes: 1943, $4,632,121; 1942, $7,295,797.

•

BESSEMER LIMESTONE & CEMENT CO., Youngstown, Ohio, showed the following income account for the years ended December 31:

	1943	1942
Net sales, etc.	$1,999,350	$2,265,370
Costs & expenses	1,618,812	1,605,763
Deprec. & deplt.	215,360	189,956
Oper. income	165,178	469,651
Other income	32,001	28,165
Total income	197,179	497,816
Interest	4,008	6,486
Fed. inc. tax, etc.	98,000	89,984
Excess prof. tax		271,316
Debt retire. cred.	.....	cr 15,300
Post-war tax cred.	cr 264	cr 11,832
Net income	95,435	157,162
Preferred divs.	74,943	75,524
Common divs.	37,401	37,418
Surp. for year	d 16,909	44,220
Earn. surp., 1-1	371,914	351,598
Adjustments	16,012	23,904
Earn. surp., 12-31	338,993	371,914
Earn., pfd. share	$3.82	$6.29
Earn., com. share	0.14	0.55
No. of pfd. shares	24,981	24,981
No. of com. shares	149,583	149,583

•

BOSTON SAND & GRAVEL CO., Boston, Mass., presented the following income account for the years ended December 31:

	1943	1942
Gross profit	$1,565,905	$2,420,638
Oper. exp., etc.	1,395,921	2,129,687
Deprec. & deplt.	69,596	103,573
Taxes	47,767	94,598
Balance	52,621	92,780
Bond interest	13,083	14,777
Net profit	39,538	78,003
Times int. earn.	4.02	6.28
Earn., pfd. share	$2.60	$5.12
[1] Earn., com. share	d 0.28	0.50
No. of pfd. shares	15,228	15,228
No. of com. shares	49,135	49,135

[1] Disregarding preferred arrears.

•

INDUSTRIAL SILICA CORPORATION, Youngstown, Penn., reported the following income account for the years ended December 31:

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	1943	[3] 1942
Gross profit	$807,917	$742,008
Selling, etc., expense	175,789	175,407
Deprec. & deplt.	75,195	70,357
Operating profit	556,933	496,244
Other income	7,281	5,899
Total income	564,214	502,143
Other deductions	30,331	22,729
Fed. income tax	68,000	84,500
Excess prof. tax	287,500	156,500
Post-war tax cred.	cr 28,750	cr 15,650
Net income	207,133	254,064
Preferred divs.	121,875	97,500
Surplus for year	85,258	156,564
Earn. surplus, 1-1	383,213	369,810
Bldgs., equip., loss	.....	[4] 37,694
[1] Silica dep. loss	12,804	105,467
Earn. surpl., 12-31	455,667	383,213
Earn., pfd. share	$13.81	$16.94
[2] Earn., com. share	1.02	1.46
No. of pfd. shares	15,000	15,000
No. of com. shares	107,215	107,215

[1] Loss on sale or exhaustion of silica deposits, less portions applicable to capital surplus.

[2] Disregarding preferred arrears.

[3] Revised to give effect to reduced taxes on income caused by subsequent claiming of exempt excess output of silica deposits as provided in Revenue Act of 1942, and to adjustments of undepleted book value of exhausted silica deposit and of compensation of employees for 1942.

[4] Loss on buildings and equipment demolished, less salvage sales.

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THE OHIO RIVER SAND CO., Louisville, Ky., had net earnings, after all charges, of $53,588 for the calendar year 1943. Total assets of $2,153,511 included current assets of $200,927, government bonds representing $72,500 of the total.

•

KENTUCKY ROCK ASPHALT CO., Louisville, Ky., reports the payment of 1⅝ percent fixed interest January 1, 1944, and 1⅝ percent contingent interest on April 1 on first 3¼-6½'s due 1945.

ROAD shocks that bounce and jar the drum . . . strains from pulling over uneven ground on the job . . . can be mighty expensive to truck mixers if transmitted directly to the transmission, power plant and other vital working parts.

REX MOTO-MIXERS are protected against such damaging road shocks by the exclusive chain belt drive that goes completely around the drum . . . providing a cushion that absorbs all shocks and strains . . . assuring minimum repairs and maintenance.

In fact, so important, so valuable is this chain drive that REX MOTO-MIXER owners say that this one feature alone—*and there are many others*—would be enough to make REX MOTO-MIXERS their choice.

Other important advantages of REX MOTO-MIXERS? The Rex end charging hopper, the exclusive Hi-Lo mixing action . . . 100% accurate water system . . . 5-in-1 Quint Spout, and many other features that make Rex the leader in the truck mixer field. For complete information about the chain belt drive and the other outstanding Rex features, send for your free copy of Bulletin 405. Write Chain Belt Company, 1649 W. Bruce St., Milwaukee 4, Wis.

CHAIN BELT COMPANY OF *MILWAUKEE*

REX CONSTRUCTION MACHINERY

What About Your Quarry Habits?

By A. J. R. CURTIS*

ARE your quarry habits good, fair or poor, judged by reasonable safety standards? That's the sixty-four dollar question for many quarry operators. It's answered for you in a brand new publication by the Cement and Quarry Section of the National Safety Council entitled "Standards for Safety in Quarry Operations."

Quarrying methods as well as quarry conditions, vary widely. The disparity is so great that heretofore there have been few if any attempts to cover them all in one set of recommendations on quarry practice. Some believed it could not be done. Then the Cement and Quarry Section of the National Safety Council got busy, and after 15 months' work, with the aid of about a hundred experienced technicians and practical quarrymen its recommendations were completed and have been published by the National Safety Council.

The special committee which handled the job was composed of the following:

J. R. Boyd, Chairman, Administrative Director, National Crushed Stone Association, Washington, D. C.

V. P. Ahearn, Executive Secretary, National Sand and Gravel Association and National Industrial Sand Association, Washington, D. C.

D. Baker, Vice President, Standard Lime and Stone Co., Baltimore, Maryland.

W. V. Brumbaugh, Secretary, National Lime Association, Washington, D. C.

P. J. Buffington, Safety Engineer, New York Trap Rock Corporation, New York City.

A. J. R. Curtis, Assistant to General Manager, Portland Cement Association, Chicago, Illinois.

R. A. Dittmar, Superintendent, Universal Atlas Cement Company, Hudson, New York.

C. H. Fry, Chief, Industrial Accident Prevention Bureau, California State Industrial Commission, San Francisco, California.

D. Harrington, Chief, Health and Safety Service, U. S. Bureau of Mines, Washington, D. C.

F. Hunt, Plant Manager, Dewey Portland Cement Company, Davenport, Iowa.

C. F. Lewis, Plant Manager, Volunteer Portland Cement Company, Knoxville, Tennessee.

W. M. Powell, General Chairman, Cement and Quarry Section, N.S.C., Safety Director, Medusa Portland Cement Company, Cleveland, Ohio.

Although quarrymen generally have recognized and followed many of these recommended practices for years, there are also a very considerable number of the latter, general disregard for which is known to have caused frequent accidents.

Physical conditions in the quarry receive first consideration in this new compilation of safe practices, the subject matter of which quickly gets down to practical details. The following provisions are stressed at the outset:

The overburden should be stripped to bedrock at least 10 feet back from the face. Side hill quarries should have the overburden removed 15 ft. from the face. The overburden should be sloped to its angle of repose throughout its entire length and precautions taken to prevent wash and slides from falling into the quarry. Many of us have seen cases where the violation of these rather primary common-sense precautions have ended in accidents often quite serious in nature. The recommendations continue with the following, among many other sound suggestions on what to do and what not to do in order to avoid personal injury to the quarry force:

Quarries located on steep hillsides, where there is danger of rolling or sliding material, should be protected by the use of baffle-boards, screens or cribbing.

Persons should not be permitted to work where falls of overburden may cause injury, or under any overhang-

*Secretary of the Committee on Accident Prevention and Insurance, Portland Cement Association.

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No. 1586—Blaw-Knox Concrete Buckets.
No. 1606—Blaw-Knox Buckets for Contractors.
No. 1696—Blaw-Knox Buckets for Single Drum Hoists for use on Railroads, Mills, Foundries, Etc.
No. 1743—Blaw-Knox Buckets for "Bartoning" handling Nitrates, Grain, Potash, Etc.
No. 1757—Blaw-Knox 2 Line Lever Arm Buckets for Rehandling, Barge Cleanup, General Purpose, Hard Digging, Dredging.
No. 1865—Blaw-Knox 4 Rope Buckets for Coal, Ore and Cleanup.

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RENT READY-MIX TRUCKS

. . . When you need more trucks IMMEDIATELY

. . . When you can get a profitable contract with a temporary increase in capacity

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GO ANYWHERE, ANYTIME

The CONSERCO "7 Point Plan" of nationwide mixer-truck rental service makes it possible for you to increase concrete production overnight without capital investment, and with no overhead to carry when extra production is no longer needed.

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1—Mixer and truck complete, 3, 4 or 5 cu. yd.
2—Experienced drivers.
3—Gasoline.
4—Oil
5—Maintenance of truck and mixer.
6—Insurance.
7—Truck delivered to the job.

Write today for complete information about the CONSERCO Plan, including rates.

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ing face or wall. The walls shall be scaled and loose rock taken down after each shot, rain, freeze or thaw, when men are required to work near the face.

Persons should be prohibited from working at the face of a pit or quarry where the material slopes at an unsafe angle, except those designated to make it safe. Persons so designated shall be required to use safety belts and life lines while so employed. The employer shall furnish and maintain in a safe condition safety belts and life lines used in this work. Life lines shall be held by a second employe or securely lashed to a fixed object in such manner that the employe cannot fall.

Persons employed on ledge operations in deep pit quarries shall be required to use life lines and safety belts on the first cut or when cleaning ledges or within 15 ft. or less of the edge or ledges inclining toward the pit or any cut, or within 3 ft. of the edge or ledges passing away from the pit or at any other time when in danger while working on the ledge. Life lines may be used as belts. Life lines shall be kept snubbed at all times to a fixed object. Persons required to use safety belts and lines shall inspect the latter to insure their safe condition.

All quarries with faces over 100 ft. high, including deep pit quarries, shall provide refuge places at safe distances from the working face. These shelters shall be large enough to accommodate all men working in the danger zone.

Vertical quarry walls are recommended in flatly pitted deposits where materials and equipment permit it. Steeply dipping large operations are excepted. Where quarries are worked in benches the latter should be at least 10 ft. wide and free from loose material. Toe boards and hand rails on cable on the open side are recommended.

Inspection

A section devoted to inspection emphasizes that examination of the quarry faces and benches should be made by persons of training and experience, properly equipped for the job. The old questions of when and how often inspections should be made are answered interestingly and probably satisfactorily for various types of operations, as follows:

Inspections should be made: (a) After blasting; (b) As often as required in thawing weather, but not less often than once each day; (c) After heavy rains and freezes; (d) At least once every 30 days in working sections of the quarry, in portions used as travelways by persons and where tracks or trucks pass nearby.

Attention is called to the often overlooked precaution of fencing in and barricading uninspected or unused areas and of posting danger signs where they will be seen.

Safe means of ingress and egress, regulations covering walkways, drainage, ladders, landing platforms and steps, and the condition and use of quarry cars, buckets, skips and other conveyances and of hoisting machinery, all receive appropriate attention.

Railroading

Quarry railroading, always exceptionally hazardous because of the nature of the road, the equipment and the loading, is covered in two sections. Although there are almost as many ideas about safe railroading in quarries as there are operators, the essentials have been carefully compiled and clearly set down. Every one of the following suggested regulations hits directly at one or several dangerous practices commonly found in quarries:

Tracks should be well laid and properly ballasted, switches being equipped and laid in conformity to A.S.A. standards. Others than inspectors and repairmen should not be allowed to walk tracks during working shifts.

Bumping blocks or their equivalent should be provided for all dead-end tracks; similar protection should be provided for elevated spur tracks. Grade crossings should be eliminated as far as practicable and crossings planked or filled between rails; stop

What 2 BEARING CONSTRUCTION means to YOU!

To enumerate all the advantages of Plat-O Vibrating Screens requires a 20-page catalog ("Better Sizing, Cheaper"—send for your copy today).

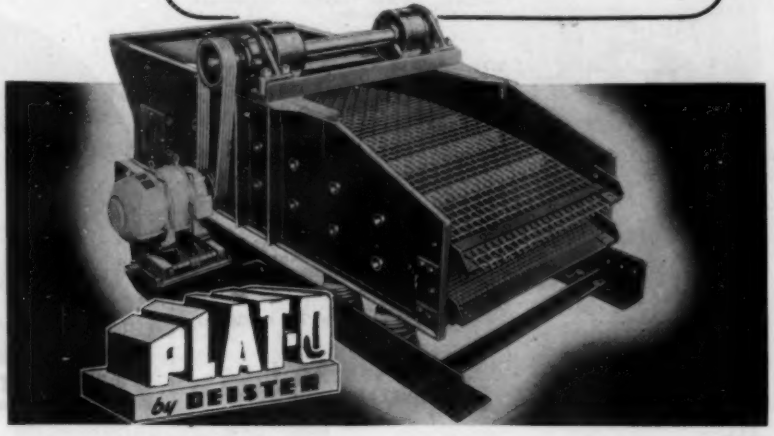
So let's talk about just one feature: BEARINGS.

A Plat-O Vibrating Screen has only two bearings. But what bearings! Both are oversize SKF spherical roller bearings—rugged and sturdy. They are lubricated by the oil bath method and neither bearing supports any of the screen's weight.

Result? Bearing life is greatly extended . . . maintenance woes are reduced . . . lost time is eliminated . . . production is maintained at the highest level, production costs at the lowest.

Here is but one instance of the meticulous care that enters into every feature of Plat-O design and construction . . . but one of the many reasons why operators everywhere are boosting production and profits with Plat-O Vibrating Screens.

DEISTER MACHINE COMPANY
Fort Wayne 4, Indiana



signs should be put up on both sides so they will be clearly visible.

Clearances are carefully set out for standard and narrow gauge track, safety switches and other appliances employed in controlling hazards connected with slopes and inclines are considered and the performance of employes engaged in quarry railroad operation receives careful attention.

Hoisting and Transporting Men

Hoisting operations involving transporting of men in cars on slopes and inclines, a particularly hazardous operation is covered as follows:

Rule 17: When men are transported in cars on slopes and inclines:

(a) Special provision should be made, in addition to the coupling, to insure against accident should the rope or the coupling of any car break or become detached, or should the drawbar of any car break.

(b) The cars should be provided with level seats and handholds.

(c) No tools, explosives, or other material should be carried in cars with men in the same trip.

Rule 18: The employer should designate the maximum number of men permitted to ride in one car and on one man-trip.

Rule 19: The hoisting rope should have at least three (3) full laps remaining on the drum when extended to its maximum distance and should make at least one (1) full lap on the drum shaft and the end should be fastened securely by means of clamps.

Rule 20: Hoisting ropes used in hoisting and lowering men should be fastened to their loads by a thimble and clamp and bridle chains, or by a spelter-filled socket and bridle chains.

Rule 21: Hoisting cables and fasteners used in hoisting and lowering men should be inspected at least once each day while the rope is travelling not over 50 ft. per minute. A detailed

RAPID DUMPING
FOR HI-SPEED

In digging and material handling, too, rapid discharge of the load is an essential feature. Every Owen Bucket is designed to incorporate rapid discharge operation — a factor responsible for their outstanding performance.

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inspection of the rope should be made once each week by a competent employe designated by the management. Written reports of the rope inspected should be made by the inspector to the official in charge of the operation.

Rule 22: Hoisting cables should not be used for hoisting and lowering men:

(a) Which show more than six broken wires in any single pitch length or lay of rope.

(b) When the wires in the crown of the strand are worn to less than 65% of their original diameter.

(c) When inspection indicates a dangerous amount of corrosion or distortion.

Rule 23: Not less than 5 ft. of cable should be cut off from the end of the hoisting cable when changing fastenings. The interior of the cable should be carefully inspected for deterioration before the fastenings are replaced.

Rule 24: Slate and deep pit quarries shall provide at least two man boxes for hoisting and lowering men out of and into the pit or quarry. These boxes shall be not less than 14 in. high by 4 ft. wide by 6 ft. 6 in. long. They shall be equipped with four corner chains. All corner chains shall be permanently secured to the man box and should be connected with a king ring which shall be attached to the cable hook when men are being hoisted or lowered in a pit or quarry. Man boxes shall be built of best grade material and shall be of sufficient strength to carry six persons.

Rule 25: All chains and cables used in and about all pits or quarries shall be of a size sufficient to sustain the maximum load hoisted out of a pit or quarry with a factor of safety of 5. The use of chains or cables which will not sustain such maximum load shall be prohibited.

Rule 26: All block, rubbish and man-box chains used in deep pit or slate quarry shall be inspected at least once a week by a competent blacksmith or hook-on.

Rolling Stock

A later section is devoted to a very complete set of recommendations concerning quarry rolling stock, one of the more frequent sources of accident in quarries employing industrial railroad trackage. Thirty-four suggested rules are given—all of them well worth teaching to the supervisors and workmen, posting and remembering.

Automotive equipment receives adequate attention in a section which includes ten rules.

Electrical Hazards

Twenty-nine rules are offered covering quarry electrical hazards under the following headings: (1) Electrical Equipment, Wiring and Lighting; (2) Transformers; (3) Noncombustible Insulating Bases; (4) Grounding; (5) Switchboards; (6) Overhead Lines; (7) Branch Circuits; (8) Cables—Type, Maintenance, Handling; (9) Trolley Circuits; (10) Lighting and (11) General.

The extensive use of electricity in quarries in recent years has introduced many hazards that may not be suspected until an accident occurs. Grounding of lines, maintenance of trailing cables on electrically operated shovels and proper handling of blasting circuits are among those which cause frequent accidents. Poorly placed and poorly maintained equipment may be big factors in the quarry accident picture.

Explosives

The most extensive portion of these suggested safe practices covers the subject of explosives, with particular reference to storage, handling, transportation and use. Sixty-five rules are suggested in the five sections devoted to explosives, covering all of the methods known to be in common use. Likewise, a following section covers drilling, including all of the common methods such as blockholing, toe hole drilling and well hole drilling.

Other Subjects

Section headings in later portions of the work include:

Shovels — Drag Lines — Stiff-leg Derricks; Haulage with Big Trucks; Crushers; Stone Storage; Overhead Cranes; Boilers; Compressed Air Machinery and

Are you giving any thought to the Cranes, Shovels and Draglines that you will be needing for the future? It is none too soon to start taking stock of your excavator and material handling requirements. Tomorrow's highly competitive markets will call for maximum economies. If your present equipment is not capable of meeting that demand, do something about it, now! We suggest that you write us today or contact the nearest Lima dealer for complete information on sizes, types and features of LIMA excavating and material handling equipment—the equipment that will help you do a better job faster at lower cost.

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Altogether there are given about 475 suggested rules for safe quarrying, carefully selected from more than twice that number of original suggestions. Quarry managers and safety supervisors are already finding this volume a most stimulating, if not challenging collection of ideas on good quarry practice. At its last meeting, the Committee on Accident Prevention and Insurance of the Portland Cement Association adopted the report of one of its subcommittees recommending that every cement plant provide its safety committee with five copies as a means of speeding up and broadening safety educational work in the cement plant quarries.

Extend Gravel Operations

TWIN CITY SAND AND GRAVEL CO., Centralia, Wash., has petitioned the city to vacate four streets and an alley in the southwest section of the city for the expansion of operations.

Chicago's Post-War Plans

AN EXPENDITURE of more than 1¼ billion dollars is contemplated in the City of Chicago's post-war public works construction program, recently outlined by Philip Harrington, commissioner of subways and superhighways. Six years would be required to complete the projects if they were taken simultaneously, but the plan is described as one of "long range" and would require considerably longer. Completion of the subway system, and construction of express highways and cross routes to all sections of the city would cost $450,000,000. Schools, water works, park improvements, and airports also call for large expenditures.

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Fluorspar in Big Demand

To SUPPLY war industries' almost insatiable demands, the fluorspar industry in 1943 produced and shipped 408,000 and 406,000 short tons, respectively, of finished fluorspar, gains of 21 and 13 percent over 1942, the previous record year, states a Bureau of Mines report.

Mines in Illinois and Kentucky supplied about 76 percent of the total fluorspar shipped in 1943, as compared with 82 percent in 1942 and 86 percent in 1941. Shipments from mines in Illinois and Kentucky were only 4 percent greater in 1943 than in 1942, whereas those in the other producing States gained 51 percent.

The increase in maximum prices for metallurgical-grade fluorspar, which became effective on November 23, 1942, and which ranged from $25 to $28 a short ton, according to calcium fluoride and silica content, compared to $23 to $25 previously did not as was anticipated result in a stimulation of production, which lagged considerably behind consumption during the first half of 1943. Consequently, effective July 1, 1943, the base prices for metallurgical-grade fluorspar were increased by $5 a ton. Concurrently, a wage raise of about 24 percent was granted mine employees in the Illinois-Kentucky district. These advances were followed by a marked improvement in production, which has since been in excess of consumption.

Production of ceramic and acid grades during the first half of 1943 was substantially greater than consumption. However, consumption of acid-grade fluorspar has been increasing at a more rapid rate than production and as a consequence it was only slightly less than production during the last half of 1943. The base prices for ceramic and acid grades of fluorspar were advanced to $37 a short ton on July 1, 1943.

Despite an increase of about 3 percent in the production of steel in 1943, consumption of fluorspar in steel mills (232,000 tons) was 4 percent less than in 1942. The smaller consumption resulted mainly from conservation measures, notwithstanding that fluorspar of lower purity was used. Nevertheless, the steel industry continued to be the principal consumer of fluorspar and accounted for 60 percent of the total consumption in 1943 as compared with 67 percent in 1942. The hydrofluoric-acid industry, the second largest consumer of fluorspar, used 114,000 tons in 1943, an increase of 40 percent over 1942; it accounted for 30 percent of the total consumption as compared with 23 percent in 1942.

PRODUCTION, SHIPMENTS, AND MINE STOCKS OF FINISHED FLUORSPAR IN 1943, IN SHORT TONS[1]

Grade	Production	Shipments to—Domestic consumers and Metals Reserve Co.	Shipments to—Foreign consumers	Shipments to—Total	Stocks on Dec. 31
Metallurgical	239,600	233,000	2,000	235,000	15,200
Ceramic	29,600	27,000	5,000	32,000[2]	300
Acid	138,400	136,000	3,000	139,000	5,500
Total: 1943	407,600	396,000	10,000	406,000	21,000
1942	337,000	351,300	9,016	360,316	19,400

[1] Figures for 1943 are partly estimated and are subject to revision.
[2] Comprises ceramic ground and flotation concentrates to glass, enamel, steel, ferroalloy, and welding rod manufacturers.

Penn. Stone Meeting

PENNSYLVANIA STONE PRODUCERS ASSOCIATION held its annual organization meeting on March 23 at the Penn-Harris Hotel, Harrisburg, Penn. Frank J. G. Dorsey, regional director, Wage-Hour and Public Contracts Divisions, U. S. Department of Labor, was the headline speaker of the meeting. Mr. Dorsey outlined the work of his division, and emphasized the importance of every company keeping employe wage and hour records as a protection against suits by employes under section 16 (b).

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Welding Rod • Etc.

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Talcott Conveyor Belt Fasteners are made in short sections which allow the belt its full pliability so it will readily conform to the trough-idlers and also will run smoothly under trippers, scrapers and on tandem drives. The teeth of Talcott Fasteners pierce between the threads of the warp of the belt, wedging the fibres more closely together without cutting or breaking them. This prevents the belts from breaking at the joint.

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OBITUARIES

HERBERT W. DEAN, former president of the Cheshire Lime Manufacturing Co., Cheshire, Mass., died recently at the age of 72. Born in Cheshire, Mr. Dean attended local schools and Pennsylvania Military College, from which he graduated as a civil engineer. He also was treasurer of the Cheshire White Quartz Sand Co., formerly operated by his grandfather, James V. Dean.

•

WILLIAM J. STEWART, retired vice-president of the Marblehead Lime Co., Chicago, Ill., and western manager of the Kansas City, Mo., office until his retirement in 1941, died recently in Columbia, Mo. He was 75 years of age. Mr. Stewart was born in St. Louis and was first employed by the old Anchor line of lake steamships in Chicago. He later became auditor of the Northwestern Steamship Co. In 1902 he joined the Marblehead Lime Company, went to Kansas City as western manager in 1905, and became vice-president in 1909.

•

WILLIAM CARL RIETH, chief engineer, Southwestern Portland Cement Co., Los Angeles, Calif., died March 28 at the age of 61 after devoting nearly 40 years to the cement industry. Mr. Rieth was born in Mannheim, Germany, and came to the United States as a young man, being first employed by the Hunt Engineering Company, where he designed and put into operation many plants. He next became associated with the Canada Portland Cement Co., after which he joined the Southwestern Portland Cement Co. with the building and designing of the Victorville plant. Later he joined the Ideal Cement Co. and built the Hanover, Mont., plant and the Ada, Okla., plant. He then again joined the Southwestern Portland Cement Co. as chief engineer and designed and built the plant at Osborn, Ohio, and redesigned the Victorville, Calif., plant. Mr. Rieth's most outstanding plant in design, flexibility of operation and economical operation was the one at Ada, Okla.

•

F. E. SORENSON, assistant superintendent of the Gladding, McBean & Co. plant at Mica, Wash., passed away recently after more than 20 years with the company. He is survived by his widow, two daughters and a son.

•

ALBERT E. DEEGAN, special field representative of Atlas Powder Co. in the West for 20 years, died in Los Angeles, Calif., after a short illness. Mr. Deegan was one of the most widely known men in the explosives industry. He joined Atlas Powder Company in October, 1924, in the capacity of special field representative. Previously he had served with several mining companies in the West as miner, powder man and foreman-superintendent.

•

ADOLPH LOEFFLER, founder of the Wisconsin Lime & Cement Co., which has since gone out of business, died recently.

•

FRED J. BINDER, general foreman of the Inland Lime & Stone Co., Manistique, Mich., died March 9 at his home. He was well known to officers of ships which load limestone at Port Inland, Mich.

•

O. T. CURRY, owner of the Dodge City Cement Products Co., Dodge City, Kans., passed away April 5. He was 65 years old. Mr. Curry combined inventiveness with his cement products business to develop concrete well casings for shallow water irrigation wells in the Arkansas Valley and they are widely used now up and down the valley. He built the concrete rings with perforations to replace metal well casings. He also invented a mortar lock which makes a continuous concrete joint for building work. Cement block manufacture, building centrifugal pumps and well casings and installing them and simi-

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1—No. 40 I. R. Drill Sharpener.

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1—LOCOMOTIVE, 4-wheel, 10 ton, 25' boom, Brown Hoisting Co.
1—P&H 1-yd. SHOVEL, Gasoline, Reconditioned.
1—MARION, 32 STEAM, 1½ yd. SHOVEL.

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1—5½' x 44'.
1—7' x 56', and others.

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2—BAILEY FEEDERS, Type No. 2, complete with steel hoppers, 8½' dia. x 12' cone bottom.

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1—CRUSHER, Kennedy No. 14 Gyratory.
1—TUBE MILL, 5½' x 20'. F. L. Smidth Co.
1—TUBE MILL, 5½' x 22'.
1—TUBE or BALL MILL, 5' x 10'.
2—RAYMOND MILLS, 4 rolls.

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Vulcan 7' x 120', like new. And other sizes.

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4—SINGLE DECK HUMMER SCREENS, 4' x 5', complete with feeder and generator.
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lar work constituted the industry which Mr. Curry had built up in Dodge City in the past 20 years.

•

GEORGE S. BRIGHTON, president, Buffalo Crushed Stone Corp., Buffalo, N. Y., died April 11. He was 64 years of age. Graduating from Yale University in 1901, he was employed by the Chicago & Northwestern Railroad in South Dakota and Idaho before going to Buffalo. Mr. Brighton was formerly district engineer of the Portland Cement Association and in that capacity assisted in the construction of numerous highways in the Buffalo district. He was an executive of Buffalo Blacktop Pavements, Inc., when it was taken over by the Buffalo Crushed Stone Corp. in 1940.

•

ARTHUR H. QUADE, eastern representative of Wisconsin Motors, New York, N. Y., died recently at the age of 39. Mr. Quade was well known in the construction and marine fields for his knowledge of engines. During the past two years he was primarily occupied in Government work but continued his interest in civilian equipment and wartime servicing problems.

•

GORDAN JOHNSON, young son of the secretary-treasurer of The Multiplex Concrete Machinery Co., Elmore, Ohio, died April 26 following an accident in which he was hit by a motorcycle.

•

JOHN A. COOK, president and general manager of the Lansing Sand and Gravel Co., Lansing, Mich., passed away recently and the company has been dissolved.

•

GEORGE P. DIECKMANN, chemical engineer and research chemist of the Northwestern States Portland Cement Co., Mason City, Iowa, for nearly 37 years, died at his home recently following a short illness. He was 68 years old.

Born in Berlin, Germany, Mr. Dieckmann was educated in the Gymnasium and the Frederick Wilhelm U. & U. of Berlin and later the Technology Institute of Charlottenburg, Germany. In 1900 he became assistant chemist at the Alsen Portland Cement Co. of Hamburg, Germany, and in 1901 he came to the United States. He was with the Alsen Portland Cement Co. at New York in 1901-02 and was chief chemist of the Empire Portland Cement Co., Warners, N. Y., in 1903-05. The following two years Mr. Dieckmann was chief chemist of the Peninsular Portland Cement Co., Jackson, Mich., and in 1907 became chief chemist and chemical engineer of the Northwestern States Portland Cement Co. In 1940 he was awarded a gold watch by the company in recognition of his years of faithful service.

Surviving are his widow and three sons, Richard P. Dieckmann, Herbert W. Dieckmann, Universal Atlas Cement Co., Northampton, Penn., and Ralph H. Dieckmann, a granddaughter and a grandson.

•

CALVIN LESTER DAY, for many years in the engineering department of Robins Conveyors, Inc., Passaic, N. J., died March 13 following a short illness. He was 58 years old.

•

FRANCIS J. BOWERS, treasurer of the Scandinavia Belting Co., Charlotte, N. C., passed away recently.

Buys Michigan Silica

OTTAWA SILICA CO., Ottawa, Ill., has purchased Michigan Silica Co., Rockwood, Mich. Edward J. Beyer, general manager at Rockwood, will continue to direct operations as plant manager.

Erect Batching Plant

QUANDEL LUMBER CO., Minersville, Penn., is erecting a batching plant to engage in the ready mixed concrete business.

New Incorporations

Gasport Sand & Gravel Co., Inc., Hartland, N. Y., has been organized to deal in realty, sand and gravel with a capital of 200 shares of stock, no par value. Brim & Brim, Lohrmann Bldg., Lockport, N. Y., are the agents.

Catawba Agricultural Lime Co., Raleigh, N. C., with principal offices in Cleveland, Ohio, has been incorporated to operate one or more quarries. Authorized capital stock $50,000, subscribed stock $20,000. Incorporators are J. B. Ross of Forest City, Ohio; W. E. Graham and W. E. Graham, Jr., both of Cleveland, Ohio.

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Manufacturers' News

Link-Belt Co., Chicago, Ill., has been awarded the Army-Navy "E" pennant for excellence in the production of vital war material at the San Francisco, Calif., plant. This is the fifth Link-Belt plant to be thus honored.

Willamette Hyster Co., Portland, Ore., announces that R. C. "Dick" Chambers, formerly of Joseph T. Ryerson & Sons Co., Chicago, Ill., is the new purchasing representative in Cleveland. Offices have been opened in the Williamson Bldg. on Euclid Avenue.

Allis-Chalmers Mfg. Co., Milwaukee, Wis., has elected three new vice-presidents, William C. Johnson, James M. White and William A. Roberts. Mr. Johnson, formerly general sales manager, joined Allis-Chalmers in 1924. After serving in various district offices, he became sales manager of the crushing and cement division. He was placed in charge of general sales in 1942, succeeding Walter Geist, who became president. He was born in Birmingham, Alabama.

Wm. C. Johnson

Mr. White came to Allis-Chalmers in 1929 after graduating from the Alabama Polytechnical Institute. Completing the company's training course for graduate engineers, he became "trouble shooter" on shop and field jobs. In 1934 he was made manager of the LaPorte, Ind., works. He returned to Milwaukee in 1941 to become assistant general works manager, and was elevated to works manager in April, 1942. He was born in River Falls, Ala.

James M. White

Wm. A. Roberts

Mr. Roberts, who was born on a farm near Osceola, Mo., came to Allis-Chalmers as a salesman. He progressed until he was Canadian representative and then for a time operated his own agency at Regina, Sask. In 1930 he returned to Milwaukee as agricultural sales manager of the tractor division, and in 1941 he succeeded the late Harry C. Merritt as manager of the tractor division.

Wickwire Spencer Steel Co., New York, N. Y., has announced the appointment of H. C. Allington as sales research engineer with headquarters at 500 Fifth Ave., New York 18, N. Y. Prior to joining Wickwire Spencer, Mr. Allington was district manager of the Logan-Allington Co., Inc., for 12 years. He has also been associated as district sales manager with the Sharpsville Boiler Works Co., Sharpsville, Penn., and sales manager of the Schlanger Divisions of American Machine & Metals, Inc., New York, N. Y., and E. Moline, Ill.

Cutler-Hammer, Inc., Milwaukee, Wis., has announced the appointment of G. E. Hunt as acting manager of the Atlanta territory with offices and warehouse at 134 Marietta St., N. W., Atlanta, Ga.

Terre Haute Concrete Supply Corp., Terre Haute, Ind., has been incorporated with a capital of 100 shares of stock, $100 par value. Incorporators are Louis F. Hart, Charles P. O'Leary, William Leroy White, John F. Kelly and K. W. Kelly. Charles P. O'Leary, Terre Haute, Ind., is the agent.

Acker Cement Products & Supply Co., Fort Wayne, Ind., has filed amendment to incorporation papers changing name to Ace Concrete Products, Inc.

George Mattox, Inc., Speed, Ind., has been organized with a capital of 100 shares of stock, no par value, to engage in contract hauling and to operate stone quarries. Incorporators are George Mattox, Velsia Mattox and Bruce Mattox. Agent is George Mattox, 2122 Spring St., New Albany, Ind.

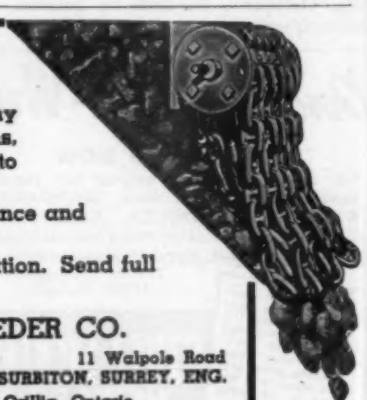
Mack Trucks, Inc., New York, N. Y., has appointed Joseph T. Meade as personnel director of Mack Manufacturing Corp., with headquarters in the Empire State Building. Prior to his appointment, Mr. Meade was personnel and industrial relations manager for Sheffield Farms Co., Inc., where he developed a supervisory training program.

Caterpillar Tractor Co., Peoria, Ill., has appointed the Cliff Miller Machinery Co. as distributor for Omaha, Nebr., and surrounding territory, with headquarters at Omaha and a store at Sioux City, Iowa. Cliff Miller will be general manager and M. Lee Coonan, assistant manager. Clare Fintzell will be sales manager.

Brill Equipment Co., New York 14, N. Y., has moved its offices and warehouse from 183 Varick Street where they have been for the past 12 years. The new offices will be located at 225 West 34th St., New York City, and the new warehouse and shop will be located at 2401 Third Ave., Bronx, New York.

Bailey Meter Co., Cleveland 10, Ohio, announces the election of E. G. Bailey, former president and company founder, as chairman of the board of directors.

THE ROSS FEEDER



Completely controls the flow of any size material from Storage Bins, Hoppers or Open-Dump Chutes to Crushers, Conveyors, Screens, etc.

High in efficiency. Low in maintenance and power consumption.

Furnished in sizes to suit your operation. Send full particulars for recommendation.

ROSS SCREEN & FEEDER CO.

18 Rector Street
NEW YORK, U. S. A.

11 Walpole Road
SURBITON, SURREY, ENG.

Canadian Licensee: E. Long, Ltd., Orillia, Ontario

Robert S. Coffin, vice-president since 1925, succeeds Mr. Bailey as president. Other officers elected are R. E. Woolley, vice-president, who has served in that capacity since 1927, and J. H. Black, secretary-treasurer.

Buckeye Traction Ditcher Co., Findlay, Ohio, has appointed A. M. Guthrie, Eastern district manager, as field sales manager, with headquarters at the plant in Findlay, Ohio.

Atlas Powder Co., Wilmington, Del., has moved the Philadelphia district sales offices of the Explosives Department to the Empire State Building, 350 Fifth Ave., New York, N. Y. Explosives sales offices, formerly at 60 East 42nd St., New York, are being moved to the new location. A sales office is being maintained at the old address in Philadelphia. W. C. Manning, assistant director of sales of the Explosives Department, has been transferred from the general offices in Wilmington, Del., to take charge of the new offices, succeeding E. W. Moorehouse, who will retire July 1 after 44 years with the explosives industry.

W. C. Manning

Koehring Co., Milwaukee 10, Wis., has announced that the Kwik-Mix Concrete Mixer Co., Port Washington, Wis., a subsidiary, which has manufactured the Koehring Dandie mixers for eight years, will now assume the sale, service, engineering and development of the 7-S, 10-S and 14-S Dandie mixers.

Barber-Greene Co., Aurora, Ill., announces that D. G. McIlwraith, secretary, has retired after 27 years of service. Mr. McIlwraith joined Barber-Greene within a year of the founding of the company and for the past two years has been taken up with the office building expansion program in Aurora. John M. Spencer, who joined Barber-Greene in 1918, has been elected to the board of directors and will succeed Mr. McIlwraith as secretary. For the past 25 years Mr. Spencer has been chief auditor.

Stearns Magnetic Mfg. Co., Milwaukee, Wis., has appointed Stanley L. Burgess as sales representative in the Detroit territory. Mr. Burgess held this position before joining the Army Air Forces in 1941, and has been reappointed since receiving his honorable discharge.

Fairbanks, Morse & Co., Chicago, Ill., has announced the opening of a new office in Tulsa, Okla., located at 1335 Hunt Building, under the management of Frank D. Ratcliffe, district manager, oil industry sales.

Sullivan Machinery Co., Michigan City, Ind., announces the election of O. J. Neslage to the position of vice-president in charge of sales in the United States and Mexico, and J. A. Drain, Jr., to the position of vice-president in charge of product engineering, research and development. Mr. Neslage during the past year was general sales manager and prior to that served as branch office manager in various offices. Mr. Drain was formerly assistant to the president, and prior to joining the Sullivan company was president of the Stafco Steel Co.

Link-Belt Co., Chicago, Ill., has opened a sales office and warehouse in Spokane, Wash., with Homer A. Garland in charge.

Yale & Towne Mfg. Co., New York, N. Y., has purchased the scale business of the Kron Company, Bridgeport, Conn., according to an announcement by W. Gibson Carey, Jr., president of Yale & Towne.

The Buda Co., Harvey, Ill., has been awarded the Army-Navy "E" pennant for excellence in the manufacture of war materials.

PULVERIZERS for the reduction of Cement Materials, Limestone, **Agricultural Limestone,** Fire Clay and All Dry, Refractory Materials.

Capacities: 1 to 60 tons per hour **Finenesses: 20 to 350 mesh**

BRADLEY PULVERIZER CO.

ALLENTOWN, PENNA.

To Increase Capacities or Fineness of Present Grinding Plant—
To Reduce Power and Maintenance Costs—
To Insure an Absolutely Uniform Product—

***Use the* BRADLEY AIR SEPARATOR**

ERIE THE COMPLETE LINE **BUCKETS**

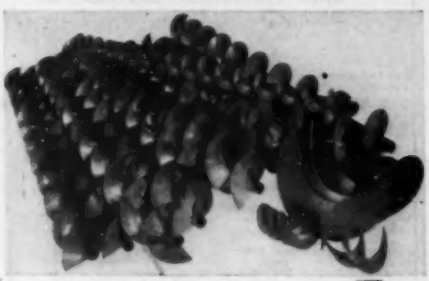
Erie builds *all* types of buckets in various weights and capacities to meet the job and operating conditions. Choose the correct bucket for the job and you get the maximum speed and output. Write for broadside on the complete Erie line of buckets

ERIE STEEL CONSTRUCTION CO · ERIE, PA.

AggreMeters · Buckets · Concrete Plants · Traveling Cranes

Alpha products

Screw Conveyors Any Size and Gauge. Welded Elevator Buckets All Sizes, Storage Bins, Bin Gates Special Designs, Tanks, Pressure and Storage, Plate and Sheet Metal Specialties of Steel, Copper, Stainless Steel, and Aluminum.



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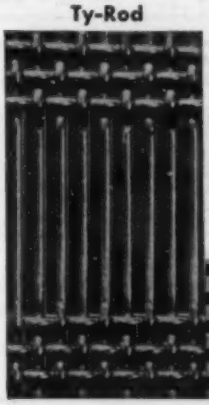
Alpha Tank & Sheet Metal Mfg. Co.

5001 South 38th Street St. Louis 16, Mo.

Ty-Rod



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TYLER

Woven Wire Screen

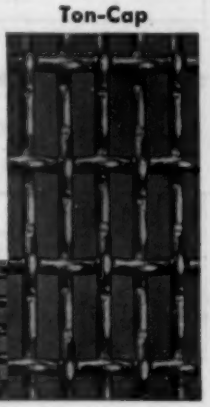
for

EVERY SCREENING PURPOSE!

Write—

THE W. S. TYLER COMPANY, Cleveland

Ton-Cap



Classified Advertisements

LIQUIDATION—Complete Whiting Plant

AT BAYONNE, NEW JERSEY

1—24" dia. x 40" **PENNSYLVANIA SINGLE ROLL CRUSHER**

1—18"x18" **LANCASTER TWO-ROLL CRUSHER**

2—**HARDINGE CONICAL PEBBLE MILLS**, 6'x36", silex lined, silent chain drives, motors and starters

3—**DORR BOWL CLASSIFIERS**—
10' dia. bowl with 2' 3"x19' 8" rake
12' dia. bowl with 2' 3"x21' 4" rake
15' dia. bowl with 2' 3"x23' rake

3—**DORR THICKENER MECHANISMS** Trays and Superstructures for 20' dia. x 10'; 30' x 12'; 40' dia. x12'

4—**DORRCO DIAPHRAGM PUMPS**, single and duplex

3—**OLIVER ROTARY CONTINUOUS VACUUM FILTERS**—
2—6'x6'
1—8'x8'

3—**INDIRECT HEAT RUGGLES-COLES ROTARY DRYERS**—
1—4'x20' Class B-2
2—5'x38'
Each of these dryers is equipped with combustion chamber, oil burner, exhausters, driving motors, etc.

3—**RAYMOND BROS. "IMP" PULVERIZERS**—
1—No. 30
2—No. 40
Each with direct connected motor, starting equipment, cyclone collector, tubular dust collector and all inter-connecting piping.

3—**OLIVER DRY VACUUM PUMPS**
14"x8"
7¼"x4"
5¼"x4"

1—5½"x5" **C-P AIR COMPRESSOR**, with 7½ H.P. motor.

1—**HARDINGE CONSTANT WEIGHT FEEDER**, with motor.

1—**HARDINGE VOLUMETRIC FEEDER**, Size "B," with motor.

3—**PORTABLE BELT CONVEYORS**, each with motor—1—20' and 2—25' c/c.

2—12"x17' c/c **WELLER BELT CONVEYORS** with steel frames.

2—**HORIZONTAL STEEL STORAGE TANKS**, 10'6" dia. x 30' long, 20,000 gal.—8'x28', 10,000 gal.

ELECTRIC MOTORS:

30—All 3 phase, 60 cycle, 220 volts, and each with starter. 1—3 H.P., 9—5 H.P., 4—10 H.P 2—20 H. P., 3—25 H.P., 4—30 H.P., 50 H.P. and 60 H.P.

MISCELLANEOUS:

Packers, Fuel Oil Pumps, Magnetic Separator, Portable Drills, Electric Grinder, etc.

See previous issue for other equipment for sale.

Arrange to Inspect. Immediate Shipment.
WIRE—PHONE—WRITE.

FOR 25 YEARS A BYWORD OF CONFIDENCE

CONSOLIDATED PRODUCTS COMPANY, INC.
15-16-17 PARK ROW NEW YORK, N. Y.
Shops and Yard at Newark, N. J., cover eight acres.

NEW

Raymond Bowl Mills for sale. One No. 493 Bowl mill with separate feeder, piping, and electrical control board. Rated capacity for use as a unit pulverizer grinding coal, 10,250 lbs.-11,150 lbs. per hour. One No. 493 Bowl mill with separate feeder, piping, and electrical control board. Rated capacity for use as a unit pulverizer grinding coal, 12,900 lbs.-14,100 lbs. per hour.

Wabash Portland Cement Company
Osborn, Ohio

FOR SALE

Besser Automatic Super Tamper Plain Pallet Stripper with V-belt motor drive, automatic pallet feeder and front conveyor. Production 390 —8" or 12" blocks per hour. 700 per hour on 4" and 6" blocks. Mold attachments to make 4", 8", and 12" x 16" blocks. 7000 Plain Steel pallets ⅛" x 12¼" x 18½". 100 Steel Lift Truck Racks. Besser 40 Cu. Ft. Mixer with V-belt motor drive. Clark Power Lift Truck, platform type. All in good condition—Used about 5 years.

CURRIER LUMBER COMPANY
17507 Van Dyke Detroit 5, Mich.

FOR SALE

GYRATORY CRUSHERS. Two Allis Chalmers No. 21 type K—One No. 10 same make & type. One No. 5, and one No. 4K. . . . Several other smaller of other make. All priced right.

REDUCTION — Allis Chalmers Newhouse type 7' with 65 HP, AC motors. Model 32 Teilsmith. One 36 inch Symons Rotary Disc. Very cheap. One 12 inch Traylor. Can be set to ¾ inch.

SPECIALS—Allis Chalmers Anaconda type XX crushing rolls 72" x 24". One 54" x 20" and one type B 42" x 16".

Two Smidth tube, (Compeb) mills 7' x 28'. Never used. . . . One Marcy Ball Mill 8' x 6' with spares. . . . One 36 inch cen. pump.

If I do not mention what you need, ask for it. I handle Compressors, Shovels, Cranes, and other mining & Industrial equipment.

Full information from

H. O. CONKLIN
1660 W. 104th St. Chicago 43, Ill.

Too Late to Classify

WANT TO BUY

1 Yd. or 1¼ Yd. Electric or Gas Elec. Shovel.

6—RD6 or RD7 Tractors.

3—15,000 to 25,000 Gal. Cap. Tanks.

THE DARIEN CORPORATION
Darien, Conn.

USED MACHINERY FOR SALE

FARREL 36"x15" B JAW CRUSHER, COMPLETE WITH MOTOR AND DRIVE

Motor 60HP Slip Ring 220 V. 3 ph. 60 C. Drive V-Flat with Ropes. Condition Excellent. Price Low.

EARLE C. BACON, INC.
17 John St., New York 7, N. Y.

FOR SALE

Guaranteed used Steel Pipe and Boiler Tubes
Wood and Steel Tanks
Buildings, Valves and Fittings

JOS. GREENSPON'S SON PIPE CORP.
Natl. Stock Yds., St. Clair Co., Ill.

---

2 yd. Gas Cat. Drag-Crane; 1½ yd. Electric. Electric Cat. Shovels—1¾-2-2-4 yard. Shovel Front Parts & mac. for P&H 206. Loco. Cranes—15-22½-27½ ton Gas-Diesel-stm. Bulldozers—Angledozers—Tractors—Diesel & Gas., inc., TD-40, TD-14, Cat. 30-50-60. Port. Plant on Pneumatics, 15x24 jaw, 20x20 rolls, 125 H.P. Diesel eng. Misc. others. Pulverisers—Mammoth 4, Jumbo 6 & 4. Sturtevant No. 2; Maxecon No. 7, Fuller 46", etc. 850 KW Uniflow Gen. Unit, 3-60-220, 200 lbs.

James Wood, 53 W. Jackson Blvd., Chicago, Ill.

AIR COMPRESSORS
BELTED: 355, 528, 676, 1000, 1300 & 1570 Ft.
ELECTRIC: 478, 676, 807, 1302, 1723 & 2300 Ft.
DIESEL: 603, 807 & 1000 Ft.
PORTABLE GAS: 110, 160, 220, 310, 540 & 1300 Ft.
STEAM: 49, 310, 528, 1300, 2200 & 3600 Ft.

CLAMSHELL BUCKETS, SKIPS & GRAPPLES
Owen R A & H Stone Grappies.
2 Yd. OWEN Type S Material Handling.
1¼ Yd., 1 Yd. & ¾ Yd. HAYWARD Class E.
18 Steel Skips 6½ x 6 x 2½.
5 Ton Bucyrus Rock Grabs.

CRANES AND DRAGLINES
1—16 Yd. 160' Boom Electric Caterpillar Dragline.
¾ Yd. 5 Ton O & S 30 Ft. Boom.
12 Ton NORTHWEST 50 Ft. Boom Gas.
20 Ton LIMA, 750 Diesel, 65 Ft. Boom.
25 Ton BROWNING & 30 Ton AMERICAN Loco.
25 Ton LINK BELT K-48 Electric, 70 Ft. Boom.

CATERPILLAR SHOVELS
¾ Yd. Lima Diesel.
2 Yd. Marion Steam Shovel.
¾ Yd., 1¼ Yd., 2 Yd. & 4 Yd. MARION Electrics.
1 Yd. NORTHWEST Gas.
1½ Yd. LIMA Diesel.
1½ Yd. BUCYRUS 41B Steamer.
4 Yd. Bucyrus 120 B Electric. Also 3 yd. Erie Elec.

DUMP CARS
46—KOPPEL 1½ Yd. 24 & 30 In. Ga., V Shaped.
15—2 Yd., 3 Yd., 4 Yd., 6 Yd., 12 Yd., 36 In. Ga.
20—Std. Ga. 12 Yd., 16 Yd., 20 Yd. & 30 Yd. Cap.
15—Std. Ga. 50 Ton Battleship Gondolas.

FLAT CARS
9—50 ton std. ga. heavy duty flat cars.

HOISTING ENGINES
Gas: 15, 30, 60, 100 & 120 HP.
Electric: 30, 52, 80, 100 & 150 HP.
Steam: 6¼x8, 7x10, 8¼x10, 10x12, 12x24.

DIESEL UNITS
75, 90, 180, 200 HP. F. M. Engines.
110 HP Ingersol Rand Engine.
175 KVA Worthington 3/60/2300.
275 KVA Fairbanks 3/60/2300.

BALL, ROD AND TUBE MILLS
5'x22" HARDINGE CON. Dry Ball Mill.
6'x22" HARDINGE CONICAL Pebble Mill.
8'x22" HARDINGE CONICAL Ball or Pebble Mill.
4x8, 5x6 & 10x9 Straight Ball Mills.
4x16, 5x18 & 5x22 Tube Mills & 6'x22'.
3½x8 & 5x7 Air Swept Tube Mills.
2x4½, 6x12 & 5x12 ROD MILLS.

PULVERIZERS
JEFFERY, 24x20 & No. 1 Sturtevant Ring Roll.
RAYMOND Auto Pulverizer No. 0000, 0 & 3.

STEEL STORAGE TANKS
10,000 Gal., 15,000 Gal. & 20,000 Gal. Cap.

SEPARATORS AND COLLECTORS
8, 10 and 14 ft. Separators, Gayco & Bradley.

ROLL CRUSHERS
36x60 Fairmount & 36x20 Diamond.

JAW CRUSHERS
10x8, 13x7½, 14x7, 15x9, 15x10, 16x9, 16x12, 16x10, 18x11, 20x8, 30x6, 30x10, 30x12, 30x12, 30x15, 30x13, 36x15, 36x30, 36x18, 36x14, 36x9, 36x6, 36x10, 36x24, 42x9, 48x34, 48x36, 60x42, 84x66, 36x16, 9x36.

CONE & GYRATORY CRUSHERS
5 No. 19, 25, 37 & 40 Kennedy.
18 in., 24 in., 30 in., 36 in. & 48 in. Symons Disc.
4—10 TZ Traylor 4 ft. Gyratory.
4—Nos. 5, 3 & 6 Austin Gyratory.
3—Traylor T-12 Bulldog Gyratory, also 16 inch & 18 in. Traylor T. Gyratory.
17 Gates K—Nos. 3, 4, 5, 6, 7½, 8, 9½ & 21.
10 Inch Austin Model 165.
6, 10 & 13 Inch Superior McCullys.

CONVEYOR PARTS
BELT: 1000 Ft.60 In., 700 Ft.40 In., 600 Ft.36 In., 800 Ft.30 In., 1642 Ft.24 In., 517 Ft.20 In., 297 Ft.18 In., 500 Ft.16 In., 300 Ft.14 In.
IDLERS: 54 In., 42 In., 36 In., 30 In., 24 In., 20 In., 18 In., 16 In. & 14 In.
Head & Tail—Pulleys—Takeup for all sizes.
Steel Frames: 2,000 Ft.24 In.,30 In.&36In.Sections.

ROTARY DRYERS AND KILNS
36 In.x20 Ft., 3 Ft.x20 Ft., 4 Ft.x30 Ft., 54 In. x30 Ft., 42 In.x24 Ft., 5 Ft.x30 Ft., 5 Ft.x16 Ft., 5 Ft.x60 Ft., 6 Ft.x60 Ft., 6 Ft.x20 Ft., 6 Ft.x70 Ft., 10x20, 7½x100&8x110 Ft. Kilns.

STEEL DERRICKS
GUY: 8 Ton 85 Ft. Boom, 15 Ton 100 Ft. Boom, 20 Ton 115 Ft. Boom, 50 Ton 100 Ft. Boom.
STIFF LEG: 5 Ton 70 Ft. Boom, 15 Ton 100 Ft. Boom,25 Ton 100 Ft.Boom,75 Ton 135 Ft.Boom.

LOCOMOTIVES
GASOLINE: 3 Ton,5 Ton, 8 Ton,12,14, and 30 Ton.
STEAM: 9 Ton, 20 Ton, 40 Ton, 60 Ton & 80 Ton.
ELECTRIC: 2 Ton, 5 Ton, 8 Ton, 40 Ton.
DIESEL: 4, 8 & 15 Ton.

SCREENS
VIBRATING 2x4, 3x8, 12x8, 3x8, 3x5, 4x5, 4x8, 4x10, 48x72, & 4x12. 1, 2 & 3 Deck.
HUMMER ROTEX, NIAGARA & ROBINS.
REVOLVING: 8x13, 3x16, 3½x15, 3x24, 4x18, 4x20, 4x22, 4x24, 5x30, 5x30, 6x30.

R. C. STANHOPE, INC.
COMPLETE PLANTS BOUGHT AND SOLD
60 East 42nd Street
New York, N. Y.

GASOLINE LOCOMOTIVE
1—20-ton Vulcan standard gauge, 4-wheel, gasoline locomotive, serial No. 3776, thoroughly overhauled.

B. M. WEISS COMPANY
Girard Trust Co. Bldg., Phila. 2, Pa.

NOTICE THE SIMILARITY

LOCOMOTIVE CRANES
4—25-ton Loco. Cranes, Browning and Industrial, oil fired, 40', 45' and 50' booms.
1—15-ton Bucyrus Erie, coal fired, 40' boom.

AIR COMPRESSORS
Portable and stationary, belt with elec. or gas power, sizes from 20 cu. ft. to 1,000 cu. ft.

CRANES AND SHOVELS
1—1¼ yd. Mdl. 650 P. & H., Ser. No. 4173, with 55' boom and shovel attachment.
1—1¼ yd. Erie gas air Model GA2, Serial No. 9758, with 45' boom and shovel attachment.
1—1 yd. Mdl. 600 P. & H., Serial No. 3502, 40' boom and backhoe attachment.
1—¾ yd. Conco crane, Ser. No. 1304, fully revolving, power 70 H.P. Continental gas engine, 30' boom.
1—¾ yd. Koehring crane Model 301, with 45' boom, Serial No. 722. Gasoline powered.
1—⅜ yd. P & H Model 400 crawler crane Serial No. 4136, with 40' boom gasoline powered.
1—½ yd. P & H shovel, Model No. 204, Serial No 2303, gasoline powered.
1—½ yd. Northwest No. 2, Serial No. 2908, comb. crane and shovel.
1—⅜ yd. Erie Model B2 crawler crane, steam powered, Serial No. 4027, with 50' boom and shovel attachment.

The successful contractor like the successful general keeps his operations as thoroughly mechanized as possible. But contractors can keep equipment investment low. They can *rent* or buy from Equipment Corporation.

CRUSHERS
1—9x12" Rogers jaw crusher (Like New).
1—No. 4 Champion jaw crusher, size 9x15", Serial No. 2606.
1—No. 2 Climax jaw crusher, size 9x16".
1—Buchanan jaw crusher, size 10x16".
1—Acme jaw crusher, Ser. No. 1873, size 12x20".
1—Acme jaw crusher, Ser. No. 1636 size 9x16".
1—United Iron Works, "Blake-type" jaw crusher, size 9½x24".
1—Allis Chalmers, No. 5 gyratory crusher, Ser. No. 5331, opening 10x38".
1—Austin No. 5 gyratory crusher, Ser. No. 2945, opening 12x35½".

DERRICKS
1—20-ton American, steel derrick, 110' mast, 100' boom.
2—Steel Guy Derricks; 1—5-ton Terry Guy Derrick, 70' mast, 60' boom; 1—5-ton Insley 75' mast, 80' boom. Stiff leg derricks: 1—35-ton Hunter, 40' mast, 80' boom; 1—2-ton Pittsburgh, 30' boom, 15' mast. Also a number of wood stiff leg derricks, 1 to 5-ton cap.

HOISTS (Elec., Gas, Steam)
85—Electric, ranging from 20 H.P. up to 125 H.P., consisting of triple-drum, double-drum and single-drum, with AC or DC motors, some with attached swingers. Following makes: American, Clyde, Lambert Lidgerwood and National.
Gas hoists ranging from 8 to 120 H.P., single, double and triple-drums; all standard makes (38 in stock).
Steam, ranging from 8 H.P. to 60 H.P., single, double and triple-drum; all standard makes.

PUMPS (Dredging)
1—10" Morris sand pump, Ser. No. 86864, cap. 87 cu. yds. per hr.
1—8" Cataract dredging pump, Ser. No. 175895, cap. 2000 GPM @ 53' head.
1—8" Morris cent. sand pump, cap. 60 cu. yds. per hr.

PNEU. TOOLS
A large quantity of Jack hammer drills, column tripod and derrick drills.

PARTIAL LIST ONLY — SEND FOR 64-PAGE STOCK LIST
All this equipment is owned by us and may be inspected at one of our plants.
WE BUY — REBUILD — SELL AND RENT

—CHICAGO 12—
1119 So. Washtenaw Ave.

—PITTSBURGH 30—
P.O. Box 933
Dept. RP

PHILADELPHIA 2
1511 Race St.

— NEW YORK 7 —
30 Church St.
Dept. RP

EQUIPMENT CORPORATION of AMERICA

Replace Missing Manpower
with
F. M. V. Equipment

3—HEAVY DUTY 2000 LB. ASPHALT MIXERS.
8—ROTARY KILNS; 7 ft. diameter by 60 ft.
2—ROTEX SIFTERS; 40" by 84"; 54" by 120".
1—MIKRO PULVERIZER No. 4 motorized.
1—HARDINGE MILL; 8' dia. x 22", girth gear and pinion.
1—ALLIS-CHALMERS DRY MILL; 4' 0" x 20', M. D.
1—AMERICAN HOIST & DERRICK CO. DRUM HOIST; No. 740, arr. for M. D., 40 HP motor.
1—DEVINE ROTARY VACUUM DRYER; 5'x30'.

FIRST MACHINERY CORP.
EAST 9th STREET & EAST RIVER DRIVE, NEW YORK

PULVERIZERS
One (1)—Sturtevant Vertical Emery Mill, new emery stones recently. Price $675.00
Four (4)—Kent Maxeon Ring Roll Mills, in good running condition, may be seen in operation. Price, each, $1675.00
One (1)—Bradley 3 Roll Pulverizer. Price, $115.00

WHITEROCK QUARRIES
Bellefonte, Penna.

FOR SALE:
1—Marion Model 7200 Electric Dragline 100' boom 7 yard Bucket. Ward Leonard Control—3 phase, 60 cycles—2300 volts. Rebuilt. Western location.
1—Bucyrus-Monighan 5-W Dragline, 90' to 120' boom. 6 yard Bucket. Fairbanks-Morse Diesel engine. Will be rebuilt when knocked down. Western location.
1—Model 615 Page Diesel Dragline, 110' boom. 4 yard Bucket.
1—Marion Model 4160 Electric Shovel. 4 yard Dipper. Ward Leonard Control. 3 phase, 60 cycles, 2300 volts. Middle West location.
2—Marion Model 490 Combination Electric Shovels and Draglines. Shovel Fronts have 2¼ and 3½ yard dippers. Dragline booms 65'. Ward Leonard Control. 3 phase, 60 cycles, 2300 volts. Completely rebuilt. Western location.
1—Lima Model 603 Combination Shovel and Dragline. 1½ yard shovel dipper. Dragline boom 50'. 2 yard dragline bucket. Hesselman oil engine.
1—Model 6 Northwest Dragline-Crane. 65' boom. Will handle 1½ yard drag bucket. Twin City gas engine. Rebuilt. Pennsylvania location.
1—Model 1500 Speederane Dragline-Crane. 1¼ yard dragline bucket. Hercules gas engine. Rebuilt. Pennsylvania location.
1—Model 1500 Speederane. 1¼ yard shovel. Cummins Diesel engine. Rebuilt. Hazleton, Pa., location.
1—10-B Bucyrus-Erie ½ yard shovel. Gas powered. Rebuilt.
1—Model 100 P & H ⅝ yard shovel. Gas powered. Rebuilt.
1—FD Cletrac-Diesel Angledozer. Completely rebuilt.
1—Loomis "Clipper" 44 gasoline powered full crawler blast hole drill. Rebuilt.
1—Marion Model 37 1¾ yard. High-Lift Steam Stripping Shovel, 32' boom, 22' handle. Good condition.

FRANK SWABB EQUIPMENT COMPANY
HAZLETON, PA.
Telephone 3906

TRACTORS—SCRAPERS—DOZERS

1—TRACTOR, Allis-Chalmers, Model L, equipped with front Push Bumper and Electric Starter **$2,250.00**

1—BULLDOZER, LaPlant-Choate Hydraulic Model B71, for new type Model D7 "Caterpillar" Tractor **$797.50**

3—TOURNAPULLS, LeTourneau Super C, 12 cu. yd. capacity, powered by Cummins Diesel Engines, equipped with 21 x 24 Tires on Tournapull, 2—18 x 24 Tires on Scraper. Each **$10,871.00**

1—TRACTOR, International Model TD40 Diesel, operating condition..... **$1,495.00**

1—TRACTOR AND DOZER, "Caterpillar" Model 40 Gasoline, equipped with Athey Bulldozer **$2,075.00**

1—TRACTOR, "Caterpillar" Model 35, Diesel **$1,840.00**

CRUSHERS—COMPRESSORS—DRILLS

1—COMPRESSOR, Sullivan, Class WL-60C, 2 stage, 270 cu. ft. capacity, 870 RPM, complete with air tank, A-1 condition This unit can be adapted to Engine or Electric Motor for Direct Drive.. **$1,000.00**

1—COMPRESSOR, Portable, Gardner Denver, 315 cu. ft, on 4 steel wheels, powered by "Caterpillar" Diesel Engine.. **$5,206.00**

1—COMPRESSOR, Gardner Denver, Portable, 105 ft. Gasoline Powered, on two steel wheels **$1,806.00**

1—VIBRATING SCREEN, Symons, Double Deck, 3 ft.-6 in. x 14 ft.-0 in., powered by 10 HP Century, 3 phase, 60 cycle, 220 volt Electric Motor..... **$1,321.00**

1—WAGON DRILL, Cleveland Model DR8, mounted on pneumatic tires, equipped with D14 Drifters. Rebuilt.. **FOR RENT ONLY**

1—COMPRESSOR, Worthington Portable, 315 ft. powered by "Caterpillar" Model D13000 Diesel Engine, all on four steel wheels **$5,418.00**

1—CRUSHER, Good Roads Model 1040 Roller Bearing Jaw Type..... **$2,475.00**

1—REDUCTION CRUSHER, Traylor Size 1 ft.-8 in Bell Type **$2,261.00**

1—CRUSHING PLANT, consisting of Tel-Smith Model 13A Gyratory Crusher. Traylor Reduction Crusher size 2 ft.-4 in. Symons Vibrating Screen 42 in. x 12 ft.-0 in., Double Deck, Bucket Elevator..... **PRICE ON APPLICATION**

1—CRUSHER, Gruendler 10 x 16 Jaw Type, Roller Bearing **$850.00**

GRADERS—ROOTERS

1—MOTOR GRADER, "Caterpillar" Model No. 12, Diesel, equipped with lights, 12 ft. blade **$5,270.00**

1—MOTOR GRADER, Adams Model No. 511, Diesel, 12 foot Blade and Scarifier..... **$5,480.00**

3—MOTOR GRADERS, "Caterpillar" Model No. 12 Diesel, equipped with Scarifier..... **FOR RENT ONLY**

1—RIPPER, Killefer Model No. 9, 5 standards with teeth, weight 3,150 lbs. **$475.00**

1—ROOTER, LeTourneau Model H3, 3 Tooth, Heavy Duty **$1,088.00**

1—ROOTER, Adams Model 40, 5 Tooth, Weight 2,300 lbs..... **$395.00**

MISCELLANEOUS ITEMS

3—PUMPS, Jaeger Centrifugal, Model 3XP, 3-inch suction and 3-inch discharge, Gasoline Powered. Each..... **$227.00**

1—PUMP, Jaeger Centrifugal Model 6P, 6-inch discharge, 6-inch suction. Gasoline Powered, on 4 steel wheel truck.... **$968.00**

1—ELECTRIC HOIST, Street Bros. 2 Drum, Powered by 15 HP General Electric Motor, 3 phase, 60 cycle, 220 volts with General Electric Controller **$1,250.00**

1—BELT CONVEYOR, Barber Greene, portable, 24 in. belt, 30 ft. long, powered by 12.5 HP Gasoline Engine, complete with Track Hopper **$1,331.00**

1—DUMP TRUCK BODY, Wood 3 cu. yd. Type C12, Serial No. 21299 with 7 in. Hoist and Power Take-off (new 1942) 6 ft. x 8 ft..... **$297.50**

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ROY-C-WHAYNE
SUPPLY COMPANY

LOUISVILLE 2
KENTUCKY

CRUSHERS, ROLLS, MILLS

Jaw Crushers: 9"x16", two 11"x20", 18"x32".
Traylor 11" "BULLDOG" Gyratory Crusher.
Robins Double Roll Spiked Coal Crusher, 24"x30".
Stevenson Single Roll Crusher, 24"x39".
Single Roll Coal Crusher with Spikes, 24"x24".
Simplex Roller Bearing Coal Pulverizer.
American Standard Disintegrator, 24"x18"x30".
Sturtevant No. 0 Rotary Fine Crusher.
Williams No. 2 Hammer Mill.
Farrel Jaw Crusher, 20"x8"-B.
Buchanan Jaw Crusher, 16"x10".

CONVEYORS

36"x175' Trough Belt Conveyor.
Selected Belt Idlers and Pulleys.
400' of 6 ply 36" Conveyor Belt.
300' of 6 ply 14" Conveyor Belt.
86' new stepped 54" Conveyor Belt.
Single strand Flight Conveyors, 11" and 15".
Steel Plate Conveyor, 47"x100', flat.
Jeffrey Foundry Mold Conveyor, 42"x150'.
Jeffrey Standard Steel Apron Feeder, 24"x60'.
Three Robins Automatic 14" Belt Trippers.
Hand Propelled Trippers for 24" and 30" belt.

BUCKET ELEVATORS

Enclosed 14"-16" Bucket Belt Elevator, up to 120'.
Enclosed 12" Bucket Belt Elevator, up to 90'.
Enclosed 8" Bucket Elevator, 55'.
Enclosed 6" Bucket Belt Elevator, 32'.
Open 16" Bucket-Chain Elevator, 50'.
Open 18" Bucket-Belt Elevator, 40'.
Open 20" Bucket-Belt Elevator, 52'.
Continuous 14" Bucket Elevator, 50'.
Continuous 30" Bucket Elevator, 35'.
New 9 ply rubber cover Elevator Belt, 22".
Used 6 ply 20" wide Elevator Belt.
Gears, Sprockets, Elevator and Drive Chain.
2,000' of C102½ Chain with K2 attachments.

MISCELLANEOUS

C-P Air Compressor, 520', 100 hp motor.
Schramm Air Compressor, 360', 60 hp motor.
I-R Air Compressor, 375', gasoline.
Two Meyers Stone Saws, 60" and 48" dia.
Lincoln 42" Open Side Planer, 10 hp motor.
Lincoln 26" Open Side Planer, 7½ hp motor.
Patch 36" Belt Driven Planer, 12' bed.
Meyers 60" Carborundum Saw, motorized.
Meyers 48" Carborundum Saw, motorized.
Mang. lined 6" Sand Pump, 75 hp motor.
Worthington 4" Centrifugal Pump, 25 hp motor.
Electric, Gasoline and Belt Driven Pumps.
Whitcomb 36" gauge 8 ton Gasoline Locomotive.
Mercury 1½ ton 30" Battery Locomotive.
Sprague Electric 6 ton Car Puller.
Cargo Type Car Puller, 15 hp, 440 volts.
V shape 30" gauge, 2 yard End Dump Car.
Flat Cars for 20" and 24" gauge.
Turntables 48" dia., cast, ball bearing.
Eight enclosed 25 hp Angle Drives. NEW.
54'-16" Screw Conveyor, U trough.

SCREENS, WASHERS

Jigger Triple Deck 2'x5' Vibrating Screen.
Hummer Vibrating Screens, 3'x5' and 4'x5'.
Tylers 15 cycle Generators for Hummer Screen.
New- "TONCAP" Cloth, framed, 3x5, 4x5.
Revolving Screens, 42"x18', 4'x10', 5'x20'.

G. A. UNVERZAGT & SONS
136 COIT ST. IRVINGTON, N. J.

CONCRETE MIXING PLANT

1—Complete modern Aggregate Plant, including 3 compartment Bins, 400 tons capacity, with scales; 1000 bbl. cement bin with scales; complete with all equipment; with or without three 1 yd. capacity, motor driven, Concrete Mixers; 440 volt, A.C.

CRUSHING PLANT

1—Complete Stone Crushing Plant, capacity 850 tons per day. Principal items are: 1—Farrel 25 x 36 Jaw Crusher; 1—Traylor 3' type TY, Reduction Crusher; 1—4 x 12 triple deck Screen; 1—long 24" Belt Conveyor and 1—short 18" Belt Conveyor; complete with steel Bins. Plant can be operated with electric motors, all of which electrical equipment is available, or can be operated with two 100 H.P. Diesel motors and one 50 KW Diesel Motor Generator Set. Plant all set up in working position; perfect condition throughout; immediate delivery.

CRUSHER SPECIALS

Farrel 36 x 48.
Allis Chalmers 7 x 12.
Reliance 15 x 24.
Universal 15 x 36.
Symons 2 ft. and 5½ ft.

MINE HOIST

1—Vulcan, single drum, 96" dia., 80" face, double reduction herringbone gears, 18" face; enclosed between three sets of bearings, complete with type D Lilly governor and all modern safety features. Will furnish with either 500 H.P. or 750 H.P. motor, 3 phase, 60 cycle 2200 volt. Hoist now operating. Built 1940, used less than two years. Offered and guaranteed the same as new. Immediate delivery.

LOCOMOTIVES SALE or RENT

1—American 41 ton, 4 wheel, saddle tank, standard gauge, cylinders 14 x 22, ASME boiler, 190 lbs. working pressure.

1—Lima 80 ton, 6 wheel, Switcher with piston valve, with tender, superheater, code boiler, 200 lbs. pressure, electric lights, Walschaert valve motion, automatic lubrication; thoroughly modern, excellent condition, immediate delivery.

VIBRATOR FEEDER

1—Jeffrey-Traylor 6 x 6' with open pan deck, 6' x 6' with 4—No. 5 heavy M-4 motors.

JAW CRUSHERS, GYRATORY CRUSHERS, ROLL CRUSHERS, DRYERS AND KILNS, HOISTS, CARS, CRANES, SHOVELS, ETC.

We will buy any modern piece of equipment anywhere.

LOG TYPE STONE WASHER

1—Allis Chalmers 25 ft., heavy duty, Hutch type, Log Washer, with steel tank, ⅜" plate, with 2 logs with paddles, 35" dia.

A. J. O'NEILL Lansdowne Theatre Building **Lansdowne, Pa.**
Philadelphia Telephone: Madison 8300

ROCK CRUSHING PLANT

2-unit outfit, primary unit consisting of 15x36" roller bearing crusher, 36" apron feeder, grizzly, conveyor delivering to secondary unit consisting of 42x24" roller bearing rolls, 36x10' 2-deck vibrating screen, sand rejector, conveyor, and side delivery conveyor, all mtd. solid rbr. tired wheels. Add'l. 18"x40' conveyor with Le Roi motor delivering to 21-yd. bin included. Completely overhauled our shop; with or without 140 hp. Wisconsin motor.

Boehek Equipment Co., 2463 W. Clybourn St., Milwaukee 3.

FOR SALE

Fuller-Lehigh Air Swept Grinding Mill 33". K-B Hammermill Pulverizer 12 x 24. Both in very good condition.

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SALE OF SURPLUS EQUIPMENT BY PRIVATE OWNER

Schramm 315 C.F.M. Air Compressor on wheels.
Cement Gun and accessories.
Rex Concrete Pump and accessories.
Also many other contractor's items.
Write for Complete List.

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Baltimore 23, Md.

One way of cutting OPERATING COSTS is to buy adequate equipment at RIGHT PRICES. It doesn't pay to get-along half equipped.

And—when no longer needed—CASH IN on it fully by selling excess equipment.

We are ready to serve you BOTH WAYS—wherever your plant is located—FROM COAST TO COAST.

TRUCK CRANE

1—Lorain Truck Crane 20 tons on six cylinder Mack Truck
1—12-ton Byers on ten-wheeler Mack truck
1—P&H 9-ton Model 150 on six-wheeler. In Excellent condition
3—Universal 6-8 tons with pneumatic tires
1—Quickway 5-tons with six pneumatic tires
1—Michigan Truck Shovel—7 tons
1—Sargent Truck crane—2½ tons on International Truck. A real buy
1—P&H ½ yd. truck crane with 20' boom on Mack truck
1—Universal 30 on Mack truck
1—Universal ten-wheeler 50' boom—in real good condition. Tire size 40x8
1—Rebuilt General Truck Crane—12 tons—10 tires 40x8

SPECIAL OFFERINGS IN SHOVELS, CRANES and DRAGLINES

⅜ yd Bucyrus-Erie 10-B dragline and shovel combination with 45' boom, drag bucket and trailer
⅜ yd Bucyrus-Erie 10-B shovel in very good condition
Bay City ¾ yd shovel—entirely rebuilt
⅜ yd Byers with 25' crane boom, skimmer scoop and backhoe attachment
⅜ yd Hanson shovel in very good condition
½ yd Bay City 25 shovel and backhoe combination—it also has a trailer
Bay City 20—½ yd shovel—would like to partly trade in against ¾ yd Bay City 20½ yd shovel with backhoe

SPECIAL

Insley late Model HK12 serial number in the 1000's with crane boom—perfect condition

Byers Model 55—⅝ yd capacity crane, shovel and backhoe combination—very good condition
General ⅝ yd shovel and crane combination
½ yd Insley 1940 model, clamshell bucket, 30' crane boom. 8 wheel pneumatic tired trailer
⅝ yd Insley shovel with ditcher attachment
½ yd Northwest Model 2 crane and dragline attachments
⅝ yd Sargent dragline—diesel engine 47' boom
Speeder B-3—½ yd dragline, fairleads—½ yd Page bucket—Hercules gas powered
¾ yd Bucyrus-Erie 20B diesel—40' boom—¾ yd clamshell bucket
¾ yd Byers crane 40' boom—very reasonably priced
¾ yd Byers Hercules, 6 cylinder engine, 30' crane boom, ¾ yd clamshell bucket
¾ yd General shovel and crane combination—gas powered
Keystone ¾ yd combination skimmer and backhoe—gas powered
Model 301 Koehring shovel and crane combination ¾ yd—40' boom, could be extended
Lorain 40 ¾ yd shovel and backhoe combination built in 1939
Lorain 40—¾ yd shovel and crane combination
Marion Model 33t—¾ yd shovel and dragline combination
¾ yd Northwest Model 3 crane with 45' boom, fairleads and dragline bucket
Northwest Model 25 ¾ yd late model, 40' dragline boom and 2 Page dragline buckets
Osgood ¾ yd shovel
¾ P&H shovel and dragline combination
P&H Model 206—¾ yd dragline—45' boom
¾ yd P&H Model 400 shovel
Sargent ¾ yd dragline, 35' boom, ¾ yd Page dragline bucket
Bucyrus-Erie gas shovel—1 yd with backhoe crane and fairlead attachments
1 yd Byers Model A gas shovel—also has crane boom attachments

GREAT BARGAIN

For all around use a Brownhoist crane 1 yd capacity in fairly good condition at a rather attractive price

1 yd Byers Model 100 combination shovel and crane—40' boom—Hercules engine—also has backhoe attachment
1 yd Keystone shovel and backhoe
1 yd Koehring shovel and crane combination with Blaw-Knox digging bucket
1 yd Model K1 Linkbelt crane
1 yd Lorain shovel and dragline combination
1 yd Lorain diesel 60-A shovel
1 yd Marion Model 7 electric shovel
1 yd Marion Model 342 built in 1940—crane, backhoe and shovel combination
1 yd Northwest No. 4 dragline—60' boom
1 yd Northwest Model 105 dragline 50' boom
1 yd Osgood dragline 35' boom
1 yd P&H Model 600 crane—35' boom in good condition
1 yd P&H Model 600 shovel, crane and dragline—50' boom
1¼ yd Bay City dragline
1¼ yd Bucyrus-Erie gas-air crane 40' boom
1¼ yd Byers shovel and crane combination—entirely rebuilt
1¼ yd Byers Master Shovel and crane combination 40' boom
1¼ yd Koehring Model 501 shovel with 50' boom
1¼ yd Lima Model 101 crane 50' boom
1¼ yd Lorain 55 gas shovel in very good condition
1¼ yd Lorain 75A crane, dragline and shovel combination
1¼ yd Marion type 460 electric dragline with 45' boom and Page bucket
1¼ yd Marion 450 gas-electric shovel powered by a 6 cylinder Buda engine
1¼ yd Northwest Model 104 crane with 50' boom
1¼ yd Northwest Model 8 crane and shovel combination—70' boom
1¼ yd Orton crane 75' boom—exceptionally good condition
1¼ yd Osgood shovel and dragline combination
1¼ yd P&H Model 700 shovel and dragline
1½ yd diesel shovel P&H Model 650 powered by Atlas Imperial diesel engine
1½ yd Speederane Model 1600 crane and dragline combination
1½ yd Manitowoc Speedcrane with 55' boom for lease only
1½ yd Bucyrus 37B shovel
1½ yd Bucyrus-Erie 41B shovel and crane combination
1½ yd Linkbelt K44 dragline
1½ yd shovel and crane combination Linkbelt K45—rebuilt
1½ yd Lorain 75B dragline—55' boom
1½ yd Lorain 75D diesel shovel and crane combination
Marion Shovel Model 450—1½ yd capacity—40' boom and fairleads
1 Northwest No. 6 1½ yd shovel and dragline combination
1½ yd Osgood crane and dragline
1½ yd P&H Model 700B shovel
2 yd Bucyrus-Erie 50B diesel shovel and dragline combination
2 yd Marion electric shovel Model 37—440 volt 3 phase, 60 cycle
2 yd Page diesel dragline with 60' boom
3 yd Page diesel dragline with 90' boom—also has 3 and 3½ yd dragline buckets
3½ yd Model 490 Marion electric shovel
3½ yd 3T Monighan dragline with 80' boom
4 yd Marion electric shovel with Ward-Leonard controls
6 yd Marion Electric dragline
20 yd Bucyrus-Erie tower machine—electric

TWO MONIGHAN DIESEL UNITS FOR LEASE ONLY

One is a 5W dragline in excellent condition with 120' boom and 4 yd and 5 yd buckets.
The second unit is a 6W Monighan diesel with a 80' boom, 8 yd bucket. Both in excellent condition

STEAM SHOVELS AND CRANES

Bucyrus-Erie Type B ¾ yd shovel and crane boom
Marion Model 37—¾ yd shovel and dragline
Marion steam shovel and crane combination with 48' boom and ¾ yd clamshell bucket
Marion Model K50—¾ yd steam shovel
¾ yd Marion Model 77 shovel and crane combination, 40' boom, ¾ yd digging bucket
¾ yd Osgood steam shovel
¾ yd Bucyrus-Erie Model B2 shovel and crane
¾ yd Erie Model 10 steam crane with 35' boom and ¾ yd clamshell bucket
1 yd Marion steam crane with 48' boom
1 yd Orton steam crane with 75' boom
1½ yd Marion steam shovel Model 32
1¼ yd Marion 450 steam crane with 60' boom
1½ yd Austin steam crane with 60' boom
1½ yd Bucyrus-Erie 35B steam shovel
1½ yd Marion steam shovel
1⅝ yd Marion steam shovel with 25' shovel front and 22' shovel stick
1¾ yd Marion Model 37 steam shovel
2 yd Bucyrus-Erie 50B steam shovel and dragline comb.
2 yd Bucyrus series 14 shovel and crane combination with 70' boom
2 yd Bucyrus-Erie class 14 shovel
2 yd Bucyrus-Erie class 14 dragline
2 yd Bucyrus-Erie 41 steam shovel
2 yd Marion Model 37 steam shovel
2 yd Marion Model 480 steam crane with 70' boom
2½ yd Bucyrus-Erie Model 70 steam shovel
3 yd Bucyrus-Erie Model 100B shovel
3½ yd Bucyrus-Monighan skid, relief type—165' bm.
3½ yd Bucyrus 95C steam shovel
3½ yd Marion Model 70 steam shovel
3½ yd Marion Model 76 on crawlers—boom length 28', dipper stick 18'
3½ yd Osgood steam shovel
3½ yd Marion 72 steam shovel
4 yd Bucyrus 100C steam shovel
4½ yd Bucyrus Class 24 dragline
5 yd Marion steam shovel Model 92B
8 yd Marion dragline with 165' boom
8 yd Bucyrus Model 3820, dragline with 170' boom
8 yd Bucyrus-Erie class 230 steam dragline

TRACTORS

Exceptionally good buys in International TD-18—TD-14—TD-9 with bulldozers and some with scrapers
Allis-Chalmers—diesel and gas
Assortment of Cletrac tractors—diesel and gas—with bulldozers and some with scrapers
For further information regarding trasters write at once and describe your requirements

DUMP TRUCKS

Three 1940 Ford Dump Trucks with 3 yd bodies—excellent condition
One lot of seven dump trucks—can be bought very reasonably. Lot consists of five Chevrolet 3 yd bodies, one Ford 3 yd and one Dodge 7 yd body
Six 4½ yd water level GMC dump trucks—machines reconditioned
Eight diesel 11 yd GMC dump trucks—delivered Dec., 1941—tires 12.00x20
Twenty Federal 1942 dump trucks with 15' long dump bodies—will send photograph and description
Two 1942 Reo dump trucks of 5 cu yd capacity
Three KOEHRING DUMPTERS with Cummins diesel engine—capacity 6 cu yd each
Five 1940 Mack trucks—two 5 tons, one 6 tons, and two 3½ tons
Three diesel 20 cu yd 6 wheel, 2 way side dump trucks
Two Sterling 5 ton trucks—very good condition
Two White 6 ton trucks
Five Euclid bottom dump truck trucks—diesel—powered by a 4 cylinder General Motor engine
Ten Euclid 10 yd gas dump trucks
Seven Euclid diesel bottom dump trucks—capacity 13 yd struck and 16 yd heap

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ABRASIVE RESISTANT COVERS

Width	Ply	Top-Bottom	Covers	Width	Ply	Top-Bottom	Covers
48"	8	1/8"	1/16"	20"	5	1/8"	1/32"
42"	5	1/8"	1/16"	20"	4	1/8"	1/32"
36"	6	1/8"	1/16"	18"	4	1/8"	1/32"
30"	6	1/8"	1/16"	16"	4	1/8"	1/32"
30"	5	1/8"	1/16"	14"	4	1/16"	1/32"
24"	5	1/8"	1/32"	12"	4	1/16"	1/32"
24"	4	1/8"	1/32"				

Inquire For Prices - Mention Size and Lengths

TRANSMISSION BELTING

HEAVY-DUTY FRICTION SURFACE

Width	Ply	Width	Ply	Width	Ply
18"	6	10"	6	6"	5
16"	6	10"	5	5"	5
14"	6	8"	6	4"	5
12"	6	8"	5	4"	4
12"	5	6"	6	3"	4

Inquire For Prices - Mention Size and Lengths

ENDLESS "V" BELTS

"A" WIDTH All Sizes | "D" WIDTH All Sizes
"B" WIDTH All Sizes | "E" WIDTH All Sizes
"C" WIDTH All Sizes | Sold in Matched Sets

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PROTECT THAT PLANT
FIRE HOSE

APPROVED SPECIFICATION HOSE
EACH LENGTH WITH COUPLINGS ATTACHED

Size	Length	Per Length
2½"	50 feet	$28.00
	25 "	16.00
2"	50 "	23.00
	25 "	13.00
1½"	50 "	20.00
	25 "	11.00

Specify Thread On Couplings

SPECIAL OFFER . . . HEAVY DUTY
RUBBER HOSE

WATER HOSE
Each Length with Couplings Attached

I.D. Size	Length	Per Length
¾"	25 feet	$4.25
1"	50 "	8.00
	25 "	6.25
1¼"	50 "	12.00
	25 "	7.50
	35 "	10.50
	40 "	12.00
1½"	50 "	15.00
	25 "	10.00
	35 "	14.00
	50 "	20.00

AIR HOSE

I.D. Size	Length	per Length	Couplings
½"	25 feet	$5.00	$1.50 Pair
	50 "	10.00	1.50 "
¾"	25 "	6.25	2.50 "
	50 "	12.50	2.50 "
1"	25 "	10.00	3.50 "
	50 "	20.00	3.50 "

LARGER SIZES ALSO AVAILABLE
All Prices—Net—F.O.B. New York

CARLYLE RUBBER CO., Inc.
62-66 PARK PLACE — NEW YORK, N. Y.

Announcement!

on May 1st, 1944
We Will Be Located at
Our New Quarters
225 West 34th Street
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We wish to thank you for your share in making this possible.

Send for our Removal Sale Circular listing attractive purchases.

SPECIALS!

2—Marcy No. 64½ Steel Lined Ball Mills, with steel balls

20—Tons Forged Steel Balls, 2" to 4"

3—Allis Chalmers Crushing Rolls, 36" x 15", 28" x 15"

2—Blake Jaw Crushers, 10"x20", 9" x 15"

1—Oliver 8'x 3½' Rotary Filter

10—Bucket Elevators, 30' to 75' centers

8—Belt Conveyors, 20' to 50' centers

1—Vulcan 6' x 42' Rotary Dryer

1—Raymond 3 Roll High Side Roller Mill, with motors

4—Rotary Dryers 4' x 30' to 6' x 64'

5—Tyler Screens, 3' x 5', 4' x 5'

2—Jeffrey Type "A" Hammer Mills, 36" x 24", 24" x 18"

BRILL EQUIPMENT CO.
225 WEST 34th STREET
NEW YORK 1, N. Y.

STRIPPING SHOVEL

Bucyrus-Erie, steam, Model 225B, boom 85', stick 54', dipper 6 yd. Very attractive price.

THE INDUSTRIAL EQUIPMENT CORP.
P. O. Box 1647
Pittsburgh 30, Pa.
Warehouse: Carnegie, Pa.

FOR SALE

1—2' Coarse Bowl Symons Cone Crusher completely rebuilt with new manganese head and brass bowls and oil pump and tank.
Price—f.o.b. Los Angeles, Calif...$3,000.00

1—3-cu. yd. heavy duty Esco Dragline Bucket with new teeth, new manganese chain and rigging complete.
Price—f.o.b. Los Angeles, Calif...$1,800.00

1—14x36 Roller Bearing Pacific Jaw Crusher with new manganese jaws.
Price—f.o.b. Los Angeles, Calif...$2,250.00

1—Chicago Pneumatic Portable Air Compressor 380 cu. ft. capacity—overhauled.
Price—f.o.b. Los Angeles, Calif...$2,250.00

COLLINS & HAMILTON EQUIPMENT COMPANY
2421 East 57th St. Los Angeles, Calif.

FOR SALE

1 Crushing Rolls, Garfield Type, 54" x 20".

2 Sets Manganese Roll Shells, 54" x 20". New.

1 Lippman Scrubber Screen, 72" x 18'. Complete with G.E. 20 HP motor, 440 volt, with starter.

1 Tyler Type 31 Tandem Hummer Screen 8' x 5', 3 surface with G.E. Motor Generator Set Type G2 with 3 HP 440 volt motor.
First Class Condition. Priced for quick sale.

American Zinc Company of Tennessee
Paul Brown Building, St. Louis, Missouri

SHOVELS—CRANES

Buc. Erie 37B, 1½ yd. Gas Shovel.
Buc. Erie 50B, 2yd. Stripping Shovel, steam.
Marion 37, 1¾-yard Steam Shovel.
Buc. Erie 43B, 1¾ yard Gas Shovel.
P & H 700B, 1½ yard Crane & Shovel.
Page Walker 2 yd. Dragline, Diesel.
Lorain 30 Shovel, Crane & Backhoe, rebuilt.
Bay City ½-yard gas Shovel.
Speeder ½ yard Crane & Backhoe.
Moore Speedcrane, 15 tons, gas 65' bm.
Bucyrus Erie Model 1030 Electric Tunnel Shovel.
Buc. Erie Steam Dragline, 6 to 8 yd. bucket.
Northwest Model 105 Shovel-Backhoe, 1 yd. Rbit.
Koehring 301, ¾ yd. Crane and Shovel.
Brownhoist 7½ ton Gas Crane.
Ind. Brown hoist 10-ton Cat. Crane, gas.

TRACTORS AND MISCELLANEOUS

Caterpillar D6 Tractor wih bulldozer.
Allis Chal. LO Tractor with bulldozer, rebuilt.
2—Cletrac FD Tractors with bulldozers.
Allis-Chalmers WK Tractor with bulldozer.
Cletrac 27 Tractor with angledozer.
TD9 Tractor with Shovel Front and Bulldozer.
Allis-Chalmers L Tractor with Baker bulldozer.
5—Euclid Trac-Trucks, Deisel, 9 yd.
Bucket Elevator, vertical, 40', 24" buckets.
Ransome 34E Dual Drum Paver. Excellent.
I.R. two stage, 315 CFM, Portable Compressor.
6—I.R. Wagon Drills.
4—Gardner-Denver Wagon Drills.
6—Spencer Dust Collectors, equal to new.
Steel stiff-leg Derrick, 35-ton, 100' bm. Excellent.
2—Steel Stiff-leg Derricks, 10 tons. 100' bin.
Hardinge Conical Ball Mill, 4½' x 16".
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Telsmith 20-B steel frame Gyratory, V-belt drive.
Gyratory Crusher; K.V.S. 30, 37-S, 49; 22, 8A, 8B; Traylor 8"; McCully 13", 8", 6".
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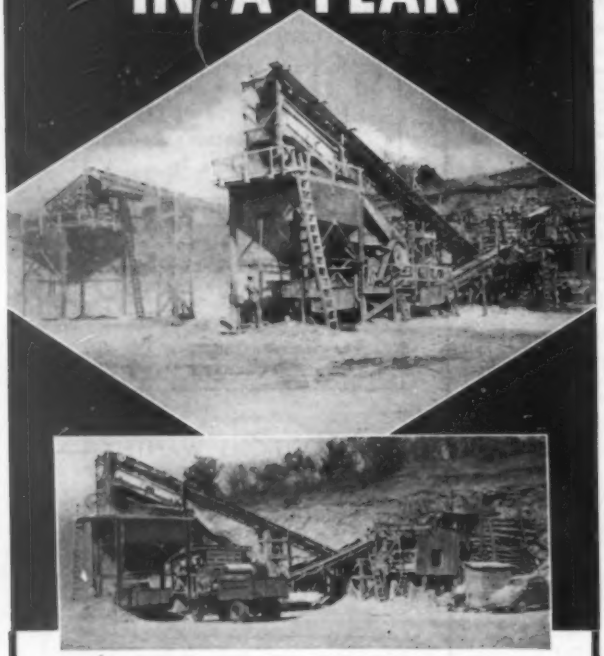

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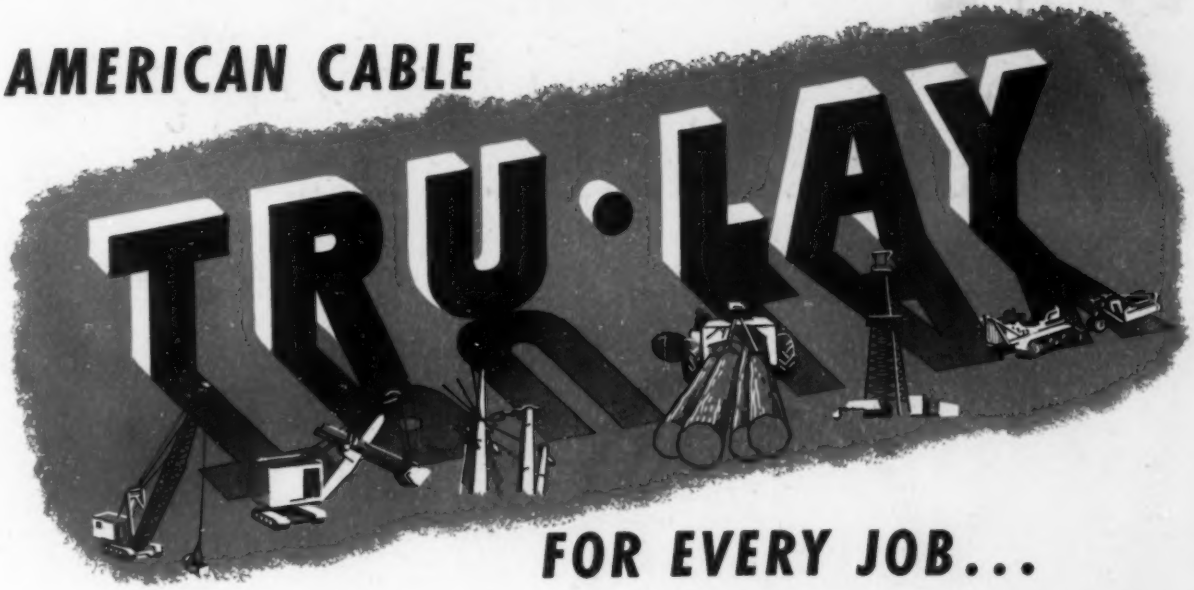

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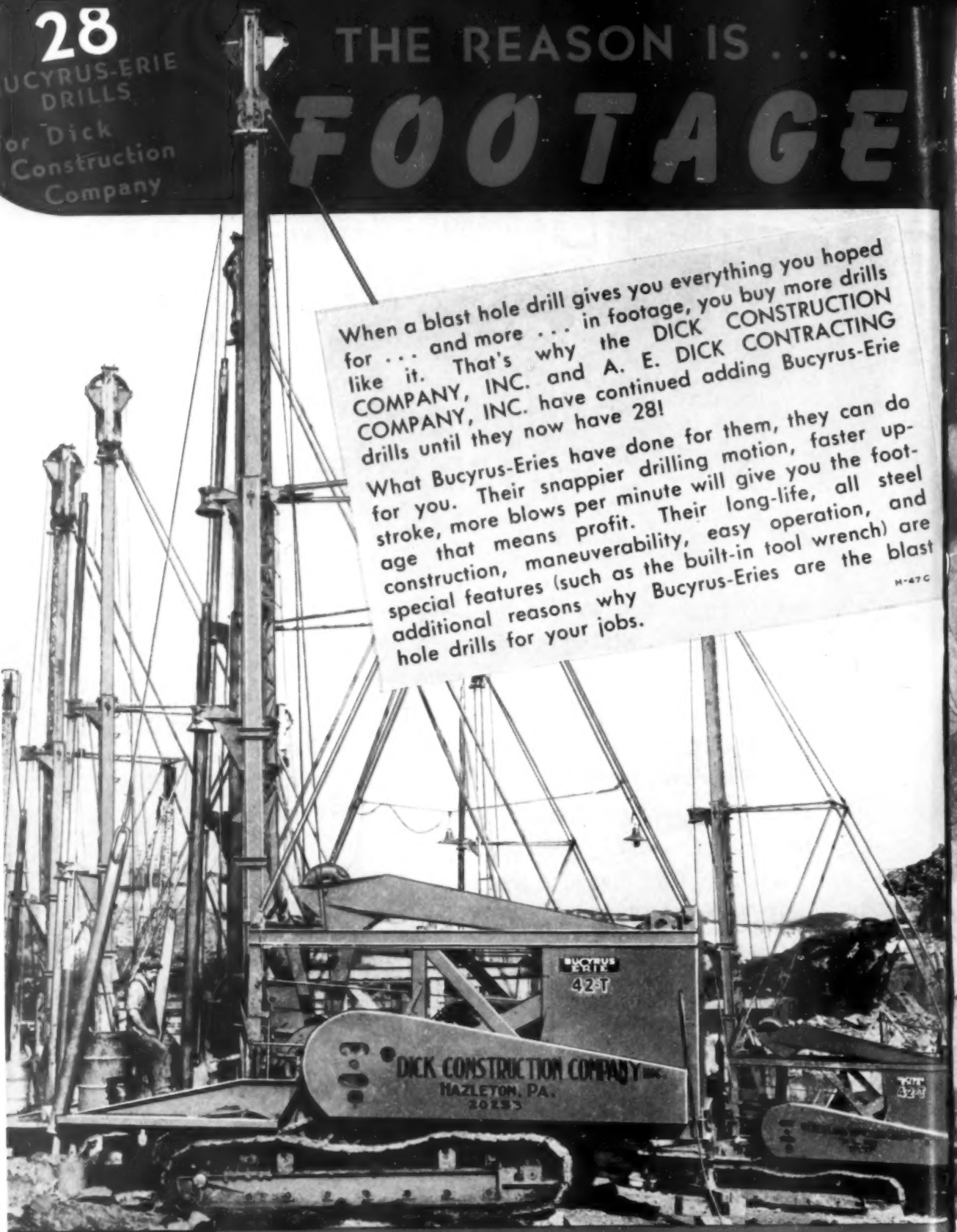

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